

REPORT OF

KANSAS SOURCE WATER ASSESSMENTS

Prepared for:

**Kansas Department of
Health and Environment**

Prepared by:

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29587

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Mr. Rob Beilfuss
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Kansas Department of Health and Environment
Bureau of Water – Watershed Protection

KDHE SWA
Source Water Assessment
For Approval Report
Project Number 29587

Dear Mr. Beilfuss:

According to our contract dated December 4, 2001, please find the “Final” *Source Water Assessment Report*. This report presents a summary of the background for the Source Water Assessment Program, the methods used to establish this program, it’s subsequent findings, and revisions that were made in the draft report. This report is the conclusion of the first of three steps in safeguarding Kansas’s valuable resources. The ultimate goal of this first step was to assess and evaluate the source water vulnerability of the public water supplies in Kansas. The findings of which can be found in Part V of this report. Part V highlights source water vulnerabilities on a state wide level and on an individual river basin level.

We appreciate the opportunity to serve the Kansas Department of Health and Environment and your staff’s assistance. The project team remains ready to discuss the details of this report at your convenience.

Sincerely,

L. Jeffrey Klein, P.E.
Project Manager

**Kansas Department of Health and Environment
Watershed Management Branch
Source Water Assessment
KDHE 29587**

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ENGINEERING CERTIFICATION

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GLOSSARY OF TERMS

GLOSSARY OF TERMS

AA – Assessment Area

ASWAT – Automated Source Water Assessment Tool

BMP – Best Management Practice

CCR – Consumer Confidence Reporting

EPA – Environmental Protection Agency

IOC – Inorganic Compound

KDHE – Kansas Department of Health and Environment

KRWA – Kansas Rural Water Association

LEPP – Local Environmental Protection Program

PWS – Public Water Supply

SDWA – Safe Drinking Water Act

SS – Susceptibility Score

SLS – Susceptibility Likelihood Score

SWA – Source Water Assessment

SWAP – Source Water Assessment Program

SIC – Standard Industrial Classification

TAP – Technical Assistance Provider

VOC – Volatile Organic Compound

INTRODUCTION

INTRODUCTION

A. OVERVIEW

This report describes the implementation of the Source Water Assessment Program (SWAP) for Public Water Supplies (PWS) in Kansas and summarizes the associated results. Kansas is required to complete their SWAP by June 30, 2004 as part of the 1996 amendments to the Safe Drinking Water Act.

There are three basic steps in source water protection:

1. Source Water Assessment (SWA).
2. Source Water (Watershed for surface water or Wellhead for groundwater) Protection Plan.
3. Plan Implementation.

This report covers the first step, the SWA. Data and conclusions developed in this SWAP phase of source water protection are available to serve KDHE and PWS as a foundation for development of source water protection plans and implementation of those plans. Results from a public water supplier's (PWS) SWA identify the major potential threats of contamination and allow the PWS to prioritize solutions. Use of the SWA will help safeguard current and future water supply and benefit all users in the state of Kansas.

B. CONTRACT HISTORY

KDHE contracted with Burns & McDonnell in December 2001 to help implement the Kansas SWAP plan. The primary focus of this contract was to develop the Automated Source Water Assessment Tool (ASWAT) to expedite completion of the SWA process and encourage PWS and public participation. This contract will fulfill the first obligation in protecting Kansas's valuable drinking water resources.

PART I

BACKGROUND

PART I

BACKGROUND

A. OVERVIEW

This section of the report discusses the background of SWAP. The ultimate goal of SWAP is protection of Kansas's valuable drinking water resources. The best means of protection is prevention or avoidance of contamination in our drinking water. Contamination could result in a dramatic increase water supply costs for the public and more importantly, pose a potentially serious public health threat.

B. REGULATORY

The 1996 amendments to the Safe Drinking Water Act require each state to develop a SWAP. Additionally, each state is required to develop a SWA for each public water supply that treats raw source water for potable use. In Kansas, there are 762 PWS that require assessments. Each SWA includes the following steps:

- Step 1 – Delineation of the assessment area.
- Step 2 – Inventory of potential contaminant sources.
- Step 3 – Completion of a susceptibility analysis.

SWAs are also made available to the public for review and comment. KDHE's Watershed Management Section has executed the Kansas SWAP plan and ensured that all SWAs will be completed by June 30, 2004.

C. KANSAS SOURCE WATER ASSESSMENT PROGRAM PLAN

1. Overview

SWAP is just one step in a multi-faceted plan presented by KDHE to protect Kansas's source water. SWAP's first step is an assessment and evaluation of source water vulnerability. The second step is the development of a source water protection plan, and the third step is implementation of water quality protection measures. Each SWA includes delineation of the source water assessment area,

development of potential contamination source inventories, and completion of a susceptibility analysis.

PWS participation is a key to the successful completion of SWAP. The Safe Drinking Water Act (SDWA) dictates that states complete an assessment for each PWS; however, KDHE encouraged PWSs to directly participate in the completion of their own SWA. Public participation improves the accuracy of the SWA and helps build momentum towards the ultimate goal of source water protection. Technical assistance providers (TAPs) were provided in the program to assist the PWSs and to complete the SWAs for those PWSs that were not interested in participating. Initially, PWSs were asked whom they preferred to serve as their TAP. Based on their responses, location, and familiarity, TAPs were assigned PWSs to serve by KDHE. The following is a list of the TAPs involved and their corresponding efforts:

- Local Environmental Protection Program (LEPP) – LEPP offered their technical expertise to PWSs. Their existing relationships with PWSs encouraged participation with SWAs. They also assisted in the completion of SWAs when no PWS participation was made. Their knowledge of area water supplies and geologic conditions made them formidable candidates for this project.
- Kansas Rural Water Association (KRWA) – KRWA assisted in PWS recruitment, training assistance, promotion of SWAP, and the distribution of information to PWSs. They also assisted several PWSs in the completion of SWAs.
- Groundwater Management Districts – Groundwater management districts offered their technical expertise to PWSs, promoted PWS participation, and assisted in the completion of SWAs when PWS elected not to participate.
- KDHE District Office Staff – KDHE district office staff assisted in the development and distribution of information for PWSs. Their knowledge and

expertise was utilized in TAP recruitment, training, and selection. They also completed SWAs when a PWS elected not to participate.

- Burns & McDonnell - Burns & McDonnell developed, with the assistance of KDHE, the Automated Source Water Assessment Tool and prepared the technical guidance that was distributed to all TAPs as a resource for technical issues. They were also involved with TAP recruitment and training. Additionally, they served as TAPs for PWSs for all 12 major water bodies and assisted in the completion of SWAs, as well as completed several SWAs when the PWS elected not to participate.

2. Delineations

In order to delineate the source water assessment area, the land area surrounding a surface water or groundwater diversion point through which contaminants could move and reach the well (groundwater) or intake (surface water) had to be identified. The Kansas SWAP uses the fixed radius delineation method for groundwater wells and the watershed method for surface water intakes. The assessment area is centered on wells or intakes that PWS use as their source of water. Three zones (A, B, and C) were set for every water diversion.

3. Inventories of Potential Sources of Contamination

A combination of Business Analyst and available State and EPA databases were used to identify potential sources of contamination within the assessment area such as confined animal feeding operations, hazardous waste facilities, and leaking storage tanks. Even unregulated sites within the assessment area are included, such as gasoline service stations or auto truck repair services.

4. Susceptibility Analysis

The susceptibility analysis consists of about 50 questions pertaining to the potential threat or threats of contamination that are specific to three zones (A, B, and C) in the assessment area. Zone A consists of the immediate area around a

Table I-1
Assessment Area Definition Summary

Type	Source	Zone A	Zone B	Zone C
Groundwater	Well	100' radius	2000' radius	2 mile radius
Surface Water	Small City Owned Lake	1000' radius from intake	Zone A + 100' off shoreline + 4 mile reach of tribs + 0.5 mile riparian buffer	Balance of the watershed
	Multi-purpose Federal Reservoir	1000' radius from intake	Zone A + 3 miles beyond top of conservation pool	Balance of watershed
	River Intake	1000' radius from intake + 16 miles upstream for 0.5 mile riparian buffer	16 to 65 miles upstream for 0.5 mile riparian buffer	Balance of watershed

Note: Assessment areas are discussed in more detail in Part III.

well (or well field) or the surface water intake. Zone B surrounds Zone A, and Zone C surrounds zone B. Using the results of the contaminant source inventory, the likelihood that the PWS could be impacted by the contaminant sources located within the source water assessment area is estimated.

5. Public Involvement

According to the SDWA, SWAs must be made available to the public. KDHE solicited public comments and involvement throughout the entire SWAP process. Several public meetings were held early on in the process to solicit public input during the synthesis of the Kansas SWAP plan. As previously stated Kansas also encouraged PWSs to directly participate in the completion of their SWAs.

Public involvement was used not only to inform the citizens, but also to improve the accuracy of the SWAs through the use of local input. Public involvement provided them with the information on potential threats to their water supply sources, the vulnerability of their water source to contamination, and education on

methods to protect their water quality. Public involvement in SWAP has set the foundation for future source water protection plans. Many Kansas communities are taking ownership of their drinking water resources and pursuing the development and implementation of source water protection plans.

PART II

INFORMATION & EDUCATION

PART II

INFORMATION AND EDUCATION

A. OVERVIEW

This section of the report discusses information and education activities completed during the SWAP. To ensure the success of SWAP, it was vitally important that the PWSs within Kansas understood the program fundamentals and the importance of their participation. One of the primary goals of SWAP was to solicit information from the public and inform and educate them on potential threats to their water supplies. Additionally, KDHE provided information on best management practices for source water protection. Providing basic program information to all PWSs became an important first step in their recruitment and participation in this and future source water protection projects.

B. RECRUITMENT

During PWS recruitment, points of contact and lines of communication were developed for use throughout the project. PWSs were asked to form a local SWA committee that would provide direct input into the SWA process. SWA committee participation in this project has provided a greater foundation for future protection of drinking water sources not only at the state level, but also at the local level.

Recruitment of Technical Assistance Providers (TAPs) was another important step in the initiation process. TAPs played a vital role in promoting participation and assisting in the actual completion of individual SWAs. TAP selection was based on a variety of factors including geographic location, technical capability, knowledge of the program and the PWS, and their ability to promote participation. The following types of state and local environmental organizations served as TAPs during the project:

- Local Environmental Protection Programs (LEPP)
- Kansas Rural Water Association (KRWA)
- Groundwater Management Districts (GMD)

- KDHE
- Burns & McDonnell Engineering Company

C. TRAINING

Regional training sessions for TAPs and PWSs were conducted throughout SWAP in an effort to produce quality SWAs. Training sessions informed and educated PWSs and TAPs on the background of the SWAP, Automated Source Water Assessment Tool (ASWAT), and their responsibilities. Additional information was distributed through a technical guidance document developed for this project. This technical guidance document consisted of basic information on hydrology, diversion works, pollution sources, and best management practices (BMPs) for agricultural, rural, and urban areas and is used as a resource to fully understand sources of pollution, how contamination can occur, and how pollution potential can be minimized. A copy of the training program as well as training dates and locations are included in Appendix C.

D. COORDINATION

Meetings were held between KDHE and Burns & McDonnell at key points in the project to review work completed to date, discuss tasks and schedule for completion, and review and discuss major project products, such as catalogs, training documents, and ASWAT. Monthly reports were submitted to KDHE that tracked accomplishments and activities to be completed over the next month. KDHE also met with EPA staff several times throughout the process to ensure Kansas SWAP activities met SDWA requirements.

E. WEBSITE

A project website was used as the primary means to disseminate information to SWAP stakeholders including PWSs, TAPs, and the public. The website was password secured to allow different levels of access to suit work tasks. Basic SWAP information and education material was available to anyone with Internet access.

A listing of educational materials was made available on the project's website and updated throughout the project. Notices regarding educational materials on the website or items added to the website were emailed to the PWSs and TAPs. Educational materials included technical bulletins providing information on subjects ranging from ground water hydrology and well construction to the potential health impacts of various chemicals in drinking water. The number and focus of these types of educational materials were determined through input from KDHE, TAPs, and by the types of questions received from the PWSs and their representatives.

F. BEST MANAGEMENT PRACTICES

Best Management Practices (BMPs) are essential tools in every area of today's local, regional, national, and global business. Environmental BMPs (agricultural/rural and urban) are used to optimize the amount of time and money spent to produce the desired result or product. These practices must also adhere to environmental concerns, which in some cases have regulatory compliance issues. A more in depth description of BMPs can be found in Appendix D in the technical guidance.

Minimizing non-point sources of pollution is a primary goal of the SWAP. For Kansas, agricultural and rural runoff are major contaminate issue; therefore, the use of BMPs to optimize efficiency translates to reduced water quality impacts. Four common BMPs for agricultural and rural areas are conservation tillage, crop nutrient management, pest management, and conservation buffers. Natural extensions of agricultural and rural BMPs are non-point management measures which could include irrigation water management, grazing management, animal feeding operations management (AFOs), and erosion/sediment control.

When discussing urban BMPs it is understood that pollution, to some extent, has occurred. Plans for new development are regulated and should attempt to maintain predetermined volumes of runoff that have been deemed appropriate. Areas with new

development should also attempt to implement the best layout, which includes structural controls that channel runoff to desired endpoints and minimizes erosion. Plans for controlling existing developments is much more expensive than new developments because it requires more work to manage areas that were constructed to current standards for pollution prevention. Therefore, the appropriate angle of attack is to identify priority pollutant reduction opportunities. Once this has been established, other BMPs for existing developments can be implemented, such as protecting current controlled runoff and beginning restoration and recovery programs.

PART III

AUTOMATED SOURCE WATER

ASSESSMENT TOOL

PART III

AUTOMATED SOURCE WATER ASSESSMENT TOOL (ASWAT)

A. OVERVIEW

This section of the report discusses the automated source water assessment tool (ASWAT) and how it was used in this project. The purpose of ASWAT was to support the coordination and involvement of the public, PWSs, TAPs, KDHE, EPA, and Burns & McDonnell staff during the completion of local SWAs. ASWAT was a tool nested within the Kansas SWAP website located at http://aswat.kgs.ku.edu/bmac/aswat/step1/main_step1.cfm.

The primary objective of the ASWAT was to supply a mechanism that allowed participants of the project to complete a single surface water or groundwater analysis for each assessment area (AA) in a PWS. An AA is defined as a well, group of wells, an individual surface water intake, or multiple surface water intakes that require an assessment of contamination risk. A PWS may have one or more AAs that need to be assessed depending on the type and location of the diversion.

ASWAT included a series of eight steps that collected user input to verify and complete a SWA report for each PWS. The following summarizes the eight steps:

1. Login - The welcome screen was the first step to start the susceptibility analysis and served as the login page and general information page. Every agency was required to have a user ID and password before entering the system.
2. User Information - After logging in with an agency ID, personal information was required every time a user entered the system. The user could select his or her name from an existing list or create a new user.
3. PWS Selection - Step 3 listed all the PWSs that the reviewing agency had rights to view, select, or analyze. Each PWS only has access to view and complete their SWA information.

4. AA Selection - After selecting a system for an assessment, ASWAT listed the AA located within the PWS. A PWS could consist of one or more AA. For more information on AA, see Section C (Assessment Areas) below.
5. Map of Potential Sources of Contamination - This map displayed the study area with base map data, points of diversion, assessment zones, and potential contamination sources. During this step, the user verified the location of the wells or intakes and potential contamination sources. The user also had the ability to add potential sources of contamination if not shown.
6. Susceptibility Analysis - Depending on the type of AA (groundwater or surface water and single or multiple), the user was asked to answer approximately 40 questions. These answers were used to calculate a susceptibility likelihood score (SLS) for the PWS.
7. Report - The final stage, before submitting the analysis, was the reporting stage. This allowed a user to dynamically review and or print the information entered in previous steps.
8. Submit - Step 8 was used to notify KDHE and Burns & McDonnell staff that a SWA had been completed. Once the SWA was submitted, KDHE verified it and executed the assessment process.

Note: PWSs could provide comments throughout these steps to provide local input. The comments were appended to the SWAs.

B. PUBLIC WATER SUPPLIER ACCESS

Unique login IDs and passwords were created for every PWS, agency, and TAP needing access to the system for security purposes. An ID was also created for KDHE. There are approximately 800 login IDs for ASWAT. Each login ID allowed only certain access to PWS data. The only rights a PWS user had was to login and complete a SWA for their PWS. A TAP had rights to view the PWS that was assigned to them. Administrators had rights to login to every PWS in the State.

The IDs and passwords were mailed out in a letter before ASWAT came into effect. Every PWS was mailed a letter containing information on the SWA program and requesting local participation. The letter explained the importance of local participation and provided basic instructions how to navigate ASWAT and complete a SWA.

C. ASSESSMENT AREAS (AA)

AAs were created differently for groundwater and surface water sources based on the buffers used to create the assessment areas.

1. Groundwater

All groundwater wells had three buffer zones. Zone A was a 100-foot radius around the well. Zone B was a 2,000-foot radius, and Zone C was a 2-mile radius. Groundwater AAs were classified as individual wells or groups of wells based on the distance between them. Wells within 4,000 feet of each other constituted a single AA. If a well's zone B touched another well's zone B, then they shared the entire zone B area. The wells also combine and shared their zone C areas. Zone C defined the area used for the susceptibility analysis (see illustrations C1, -2, and -3). All questions in the susceptibility analysis were targeted to one or more of these zones.

2. Surface Water

Surface water intakes also had three zones. Zone A was a 1,000-foot radius around the intake. Zone B was delineated using the criteria established in the Kansas Source Water Assessment Program Plan up to the state line or upstream reservoir. Zone B for small cities or watershed owned lakes was represented by an area based on a 100-foot lake shoreline buffer, a 4-mile reach of direct lake tributaries, and a half-mile riparian buffer. The area above the dam and within 3 miles of the reservoir conservation pool represented zone B for multipurpose federal reservoirs. Zone B for river intakes was 16 to 65 miles upstream of the intake with a half-mile riparian buffer. Zone C was the balance of the watershed.

If a PWS had two or more surface water sources whose zone B overlapped, then only a single analysis needed to be completed. An AA with multiple surface water intakes was analyzed using contamination risk factor questions for zones B and C. PWSs with a single surface water intake only had one AA and zones A, B, and C questions were used in the analysis.

If a PWS had a surface water intake and a groundwater well, the AAs were independent of one another because potential contamination sources are different for surface water and groundwater. Therefore, the AAs required two susceptibility analyses, one for groundwater and one for surface water.

There are a few instances where groundwater wells occur in river alluvium deposits and were therefore influenced by surface water. In these cases, it was appropriate to combine both groundwater zones with river intake zones for a more accurate representation of the AA.

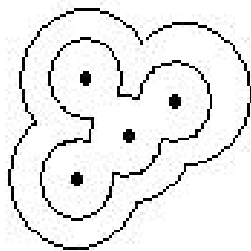


Illustration C1

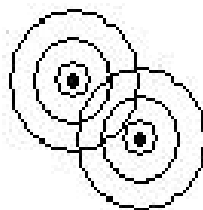


Illustration C2

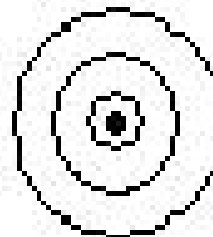


Illustration C3

Illustrations C1, C2, and C3 illustrate how a susceptibility analysis could be performed on single wells and intakes, or multiple intakes. Illustration C1 shows four diversion points that have overlapping B zones. A susceptibility analysis would have been completed for all four wells or intakes. Illustration C2 shows two diversion points where their C zones overlap but their B zones do not. In this case

one susceptibility analysis would have been performed for each well or intake.

Illustration C3 simply shows one well or intake that has one susceptibility analysis.

D. MAP

In step 5, users could gather or add information on potential sources of contamination in the AA. After an AA was selected from Step 4, a map and a list of the potential sources for the AA was generated. The map and a table of contamination sources were on the same page, which allowed users to easily reference the location while viewing tabular information relating to each contaminant source.

The map and table of potential sources interacted with each other. For example, if a potential contamination source on the map was selected, the table automatically jumped to the record, displaying information about the site. Likewise, if a record was selected in the table, it was highlighted on the map.

Potential sources of contamination included land uses, industry, or businesses that could generate or store chemicals/substances that could potentially contaminate the water supply if released into the environment. Both unregulated sites from business location databases and regulated sites from various KDHE databases were compiled.

The sites were divided into eight main categories to ease identification on the map and in the table. The following is a list of categories:

Table III-1

Regulated & Unregulated Sites

Added Sources	- Sites that did not appear in the original inventory and were added during the assessment process by a user of ASWAT.
---------------	--

Unregulated	- Places with a Standard Industrial Classification (SIC) that have been recognized as potential contaminate sites. The SIC system classifies establishments into industries on the basis of the primary activities of the establishment.
CAFO	- Confined Animal Feeding Operations (CAFOs) are locations where animals are kept and raised in a relatively confined area.
Hazardous Waste Facilities	- Hazardous Waste Facilities include the following sites: Household Hazardous Waste (HHW), Hazardous Material and Petroleum Tanks, Hazardous Waste Generators, and Hazardous Waste Treatment, Storage or Disposal Facilities (TSDF).
Leaking Storage Tanks	- Leaking underground storage tanks are sites associated with the release of materials stored in underground tanks. The majority of these sites are related to the storage of refined petroleum products.
Identified Contaminant Sites	- Identified contaminated sites are locations where releases of hazardous and non-hazardous materials have occurred in sufficient quantities to cause soil and/or groundwater contamination.
Solid Waste Facilities	- Solid Waste Facilities include the following sites: municipal solid waste landfills, closed landfills, industrial landfills, construction and demolition landfills, solid waste transfer stations, solid waste processing, and composting.
Wastewater Facilities	- Wastewater Facilities include the following sites: municipal treatment, industrial treatment, municipal lagoons, and industrial lagoons.

A set of detailed instructions was provided prior to Step 5 as shown in Figure III-1. This page of the website informed the user that a map and list of identified potential contamination sources are generated for the AA. The instructions also stated the list may be incomplete or inaccurate. The user was instructed to view a list of all possible potential sources and verify that all possible contamination sites were identified. If potential sources of contamination were not displayed on the map or in the table, the user had the opportunity to add sources to the map and comment on why they were added.



Figure III-1: Map and Potential Sources

The following sections discuss the tools and functionality of this step in more detail. The map, as shown in Figure III-2, displayed the study area with base map data, points of diversion, assessment zones, and potential contamination sources. The study area consisted of everything located in zone C. There was a legend available for the user to turn features on or off. Several functions on the map allowed the user to gather information for the AA. The tools included the following:

- Zoom In/Out – Zoom buttons were available so the user could zoom in or out of areas to increase or decrease the scale of the map so features can be identified.

Automated Source Water Assessment Tool (ASWAT) - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Go Back Forward Stop Reload Home Search Favorites Bookmarks Show Desktop Show Desktop

Automated Source Water Assessment Tool (ASWAT)

1 Login | 2 User | 3 PWS | 4 AS | 5 Map | 6 Questions | 7 Report | 8 Submit

STEP 6 of 8: Answer all sustainability analysis questions. [Click here for help.](#)

Ground Water Single Well Zone A Analysis

No.	Question	Yes	No	Default	Final	Comment
1	Is the well under the influence of surface water?	<input type="radio"/>	<input checked="" type="radio"/>	YES	NO	view/add
2	Does the well meet AS water well construction standards? Click here for information on the AS water well construction standards (ASWAT 111)	<input checked="" type="radio"/>	<input type="radio"/>	NO	NO	view/add
3	Is the depth of the well less than 30 feet?	<input type="radio"/>	<input checked="" type="radio"/>	YES	NO	view/add
4	Are there unplugged, abandoned water wells present in Zone A?	<input type="radio"/>	<input checked="" type="radio"/>	YES	NO	view/add
5	Is there gravel pack within 20 feet of the surface? Click here for information on the AS water well construction standards (ASWAT 111)	<input type="radio"/>	<input checked="" type="radio"/>	YES	NO	view/add
6	Does a PWS own or control Zone A?	<input checked="" type="radio"/>	<input type="radio"/>	NO	NO	view/add
7	Does Zone A consist entirely of surface water?	<input type="radio"/>	<input checked="" type="radio"/>	NO	NO	view/add
8	Is there a contaminated well in the Zone A?	<input checked="" type="radio"/>	<input type="radio"/>	YES	NO	view/add

Ground Water Single Well Zone B & C Analysis

No.	Question	Yes	No	Default	Final	Comment
9	Is a class V UIC well present?	<input checked="" type="radio"/>	<input type="radio"/>	YES	NO	view/add
10	Are any commercial, industrial, or urban areas present in Zone B?	<input checked="" type="radio"/>	<input type="radio"/>	YES	NO	view/add
11	Does each industrial/commercial site and urban area have a water quality protection plan in place?	<input type="radio"/>	<input checked="" type="radio"/>	NO	YES	view/add
12	Are any non-farm home sites present in Zone B?	<input type="radio"/>	<input checked="" type="radio"/>	YES	NO	view/add
13	Do all the non-farm home sites have a water quality protection plan?	<input type="radio"/>	<input checked="" type="radio"/>	YES	YES	view/add
14	Are any farmsteads present in Zone B?	<input type="radio"/>	<input checked="" type="radio"/>	YES	NO	view/add
15	Do all farmsteads have a water quality protection plan? view/add	<input type="radio"/>	<input checked="" type="radio"/>	NO	YES	view/add
16	Does Zone B consist entirely of surface water?	<input type="radio"/>	<input checked="" type="radio"/>	NO	NO	view/add
17	Is there grouting view/add in Zone B?	<input type="radio"/>	<input checked="" type="radio"/>	YES	NO	view/add

One set of susceptibility analysis questions was given for each AA. The users answered questions based on the AA and not on each water source. For example, if a PWS had 60 wells located in the AA, the answer for a question in the groundwater supply susceptibility analysis applied to all 60 wells.

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start the analysis over if they wanted to come back to it in the future. Since simple yes or no answers sometimes were not enough, users could add more detail to their responses by commenting on any of their responses throughout the susceptibility analysis process.

Thirty days after the analysis had been submitted (all questions answered), users had only one opportunity to change any responses. Beyond this 30-day period, the data was locked. If users wanted to make any changes after the data was locked, KDHE had to be contacted with sufficient justification to unlock the data.

KDHE used a qualitative (semi-quantitative) screening level that utilized general assumptions and best professional judgment to determine the PWS's susceptibility to contamination by microbiological organisms, inorganic compounds (IOCs), nitrates (groundwater only), synthetic organic compounds, pesticides, volatile organic compounds (VOCs), eutrophication/phosphorus (surface water only), and sedimentation (surface water only). It was a systematic procedure comprised of simple yes and no questions. Each question in the susceptibility analysis focused on the presence or absence of potential pollution sources in the assessment area.

An example of a question is "Is there grazing livestock in zone B?" If the user answered "Yes" to this question, one point was added to microbiological and one point was added to nitrates because livestock in zone B would pose microbiological and nitrate threats to the PWS. The rest of the contaminant categories would have received a zero because they would not be negatively impacted if grazing livestock occurred in zone B.

After completing all the questions, the scores resulted in a calculation of the susceptibility likelihood score, SLS, for each contaminant. The SLS was determined by counting the number of contamination risk factors found to occur in the delineated assessment area and applying a multiplier to the number. The multiplier was used to

establish a common score for the SLS of each contaminant category. The SLS could range from 0 to 100. The greater the number, the greater the susceptibility of the water supply to contamination by the contaminant of concern.

While the SLS is intended to reflect the relative susceptibility of the water supply to contamination by a particular contaminant group, there was not a quantitative or value scale intended. The SLS is most useful in helping the PWS focus on water quality protection actions towards a contaminant category of concern. For example, if the SLS for microbiological contamination is high relative to volatile organic compounds, water supply protection planners would conclude that attention should be directed towards microbiological contaminant sources rather than VOC sources.

F. REPORTING

1. Executive Summary

The Executive Summary lists the SLS for each contaminant of concern category as shown in Table III-2. The SLS indicates which contaminant category is most likely to impact a given public water supply. Contaminants of concern for groundwater include microbiological, inorganic compounds (IOCs), nitrates, synthetic organic compounds, pesticides, and volatile organic compounds (VOCs). Contaminants of concern for surface water include microbiological, inorganic compounds, eutrophication/phosphorus, sedimentation, synthetic organic compounds, pesticides, and volatile organic compounds. Each category was given a low (0 - 50), moderate (51- 80), or high (81 – 100) ranking.

Table III-2
Susceptibility Score & Range

Contaminant Category	A	B	B*	C	C*	D
Susceptibility Likelihood Score – SLS	54	52	51	52	48	55
SLS Range	Mid	Mid	Low	Mid	Low	Mid

2. Potential Sources

The potential sources section listed all the sites that were identified as potential sources of contamination as shown in Tables III-3 and -4. Potential sources of contamination included industrial or commercial land areas that could generate or store contaminants that could infiltrate the water supply if released into the environment. Unregulated sites from business location databases and regulated sites from various KDHE databases were compiled. Additional sites could have been added by an evaluator through the assessment process to supplement the original data.

Table III-3
Unregulated Potential Site Sources

Source No.	SIC Description	SIC ID	Zone
216140	Repair Services, Nec	7699	C
216741	Repair Services, Nec	7699	C

Table III-4
Regulated Leaking Storage Tank Potential Site Sources

Source No.	Source Name	ID/Permit No.	Zone
3000189	Eazy Stop	02193	C
3000190	5 Points Auto Parts	02207	C
3000191	Pete's Standard Service	02211	C
3000263	Appelhans Oil	03173	C
3000358	Masonry Products	04410	C
3000532	St Catherine Hospital	06259	C

The 1987 Standard Industrial Classifications (SIC) were used to help identify potential contaminate sites. The SIC system classifies establishments into industries based on their primary activity. **Although a facility or business was identified in the study as a potential concern, it does not necessarily mean a release or spill has occurred. Contamination only occurs if certain chemical**

substances are released into the environment and are conveyed into the water supply source.

The data for the potential sources of contamination was compiled from May through August in 2002. Some of the databases used were incomplete datasets that are continually being updated. Due to the incompleteness, inaccuracies, and new development, it is possible that sources of potential contamination that are in the assessment area are not included in the report. Inaccurate locations could have also caused sources to show up in the AA that are not actually in the assessment. Additionally, duplication between the datasets could have caused sites to show up multiple times in the AA.

3. Added Sources

The Added Sources section listed all the sites that have been added as potential sources of contamination by an evaluator through the assessment process to supplement the original data as shown in Table III-5. The potential sources listed in this section were sorted to show the added potential sources in zone A, then zone B, and then in zone C.

Table III-5
Added Potential Site Sources

Source No.	Source Name	SIC ID	Zone
9000671	Chemical Company	2879	B

4. Contaminant Summary

The contaminants summary showed the number of identified unregulated sources in the AA for each contaminant of concern category. In order to obtain the number of sources for each category, a relationship was correlated between each SIC and the contaminant of concern categories. Each SIC was assessed and associated with contaminant categories. For example, if not managed properly, a

car wash (SIC 7542) could potentially contaminate an intake because of IOC's and VOC's. As a result, a car wash was associated with both IOC's and VOC's.

A chart, shown below in Table III-6, displayed a count for each contaminant category. The sum for each category represented the total number of identified sources that were associated with that particular contaminant category. However, the total number of identified sources does not include contaminants from the Added Sources. In our example, a car wash is considered two sources of contamination. It is a potential source of contamination for IOC's and for VOC's. Therefore, one was added to the total number of sources in the VOC category and one was added to the IOC category.

Table III-6
Facility Count per Potential Contamination Source

MicroBiological	Pesticides	IOC's	SOC's	VOC's	Nitrates
21	6	63	20	41	20

5. Potential Contaminants

The Potential Contaminants section listed the contaminant of concern category associated with each SIC found in an AA as listed in Table III-7. The relationships defined between the SIC and the contaminant of concern categories were displayed in a table format. Using our car wash example, the relationships can be better illustrated. A car wash could release IOC and VOC chemical substances. The connection is shown by indicating the SIC, 7542, and the associated contaminant categories, IOC (Category B) and VOC (Category D). However, the protection measures listed were not associated with any Added Sources. An example of this section can be seen below.

The list was sorted by the SIC source description and it only shows unique SIC sources. For example, an AA could have 20 car washes, but the list only showed contaminant categories associated with car washes one time. This was because all

car washes have the same SIC and every car wash poses the same potential threat to water intakes. It is important to illustrate that in a case where 20 car washes are present in an AA, ASWAT identifies it as one source of potential contamination. ASWAT does not quantify the 20 car washes, instead it just recognizes that there is a potential threat of contamination in that AA.

Table III-7
Unregulated Identified Site Sources and Associated
Potential Contaminant Category

SIC ID	SIC Source	Potential Contaminant	Contaminant Category
7538	Auto Truck Repair Service	Inorganics, VOCs	B
"	"	"	D
7542	Car Wash	Inorganics, VOCs	B
"	"	"	B1
"	"	"	B2
"	"	"	D
211	Cattle Farm	Sanitary, Fertilizers TSS, pesticides, Erosion and sedimentation	A
"	"	"	B
"	"	"	B1
"	"	"	B2
"	"	"	B*
"	"	"	C*

A – Microbiological B – Inorganic Compounds B1 – Eutrophication – Phosphorous
B2 – Sedimentation B* – Nitrates C – Synthetic Organic Compounds
C* – Pesticides D – Volatile Organic Compounds

6. Protection Measures

The Protection Measures section showed water quality protection measures for the SIC identified in the AA as listed in Table III-8. Previous sections of the report were designed to show areas that a PWS could focus on to improve the susceptibility of an AA. This section helped identify water quality protection

measures that a PWS could use to address potential contaminant sites in the assessment area.

This portion of the report only displayed water quality protection measures for each type of SIC found in the assessment area. It did not display protection measures for each site in the assessment area because every SIC typically has the same or similar water quality protection management practices. However, the protection measures listed were not associated with any Added Sources. An example of this section can be seen below.

Table III-8
Recommended Water Quality Protection Measures

SIC	SIC Source	Contaminant Source	Water Quality Protection Measure	Regulatory Authority
7538	Auto Truck Repair Service	Inorganics, VOCs	Discharge to POTW. Manage oil products and used oil so that it is not in contact with water	40 CFR 442 and
7542	Car Wash	Inorganics, VOCs	Install and maintain sediment and grease traps where appropriate	40 CFR 442

7. Assessment Analysis

The assessment analysis section displayed the numbers assigned to each contaminant of concern category for each question in the susceptibility analysis as shown in Table III-9. This analysis was based on a decision tree framework consisting of a series of yes and no questions. These questions considered the proximity of contaminant sources to the water supply intake, the type of contaminant, and the application of pollution prevention or water quality protection practices to sources of contamination. As the evaluator moved through the analytical framework, susceptibility points were accumulated based on the presence of contaminant sources in the assessment area.

After all the questions were answered, the susceptibility likelihood score was calculated for each contaminant of concern category. The SLS was determined by counting the number of contamination risk factors found to occur in the delineated AA and applying a multiplier to this number. Because the number of contaminant category risk factors is not equal, the multiplier is used to establish a common scale for the SLS of each contaminant category. An example of this section can be seen below.

Table III-9
Example Susceptibility Analysis Questions

No.	Question	Response	A	B	B*	C	C*	D
1	Is the well under the influence of surface water?	No	0	0	0	0	0	0
2	Does the well meet KS water well construction standards?	Yes	0	0	0	0	0	0
3	Is the depth of the well less than 30 feet?	No	0	0	0	0	0	0
4	Are there unplugged, abandoned water wells present in Zone A?	No	0	0	0	0	0	0
5	Is there gravel pack within 20 feet of the surface?	No	0	0	0	0	0	0
6	Does a PWS own or control Zone A?	Yes	0	0	0	0	0	0
7	Does Zone A consist entirely of native grass?	No	1	1	1	1	1	1
8	Is there a contaminated well in the Zone A?	Yes	1	1	1	1	1	1

8. Site Comments

The Site Comments section listed all the comments added for the potential sources of contamination found in the AA. Local comments and feedback from people that are familiar with the AA was an important aspect of the SWA. The comments greatly improved the SWA by adding detail to the sites that could be referenced for more information.

This local information included comments on potential contamination threats, or lack there of, local water quality protection initiatives, etc. Adding comments was optional and mainly focused on sources in areas that could have the greatest impact on water supply if a spill or release occurred in the environment. It was left to the discretion of the PWS and or SWA committee to add comments.

9. Added Site Comments

The Added Site Comments section lists all the comments for potential sources of contamination added to the AA.

10. Analysis Question Comments

The Analysis Question Comments section listed all the comments added during analysis portion of the SWA, in which a series of yes and no questions were asked. Evaluators had the option to add comments to clarify why a response was given or to give more details. Local comments and feedback from people that are familiar with the assessment area was an important aspect of the assessment. The comments greatly improved the assessment by adding clarification and details that could not be identified with a simple yes or no response.

11. Map

The Map section showed the entire AA, water supplies, potential sources of contamination, and other base map data for locational reference. This section was not included in the final report for security reasons; however, PWS can access the map by logging into ASWAT or contacting KDHE. KDHE has instructed each PWS to make a copy of the SWA report and map available locally for public viewing.

The map was only intended to give a broad overview for concentrations of potential contaminating sites in the assessment area. Due to the scale of the map, clusters could appear larger than they are from an actual perspective. It should not be used for anything other than what is specified in the report.

G. PROJECT MANAGEMENT TOOLS

Step 3 served as a project-tracking tool that informed users of the current status of the analysis process for each PWS. Again, users were only able to view the status of

PWS granted to them by the system based on the login ID. The most recently submitted field displayed the date on which the last submission was made. The table also displayed the user and the agency (PWS, TAP, KDHE or BMCD) that made the most recent submission to the database. Providing this information early in the process was useful because the status of the assessment was known before accessing the data.

A map link also displayed the project progress for the entire state graphically on a map. This link included a map of the state that helped administrators understand the overall progress. The map was color-coated to show all the assessments that were incomplete and complete. A table was also provided with the map to show the number of PWS that had been accessed, submitted, and completed.

H. OTHER RESOURCES

Other resources were provided on ASWAT. Throughout the site, informational tips were provided so inexperienced users could easily complete a SWA without assistance. If additional help was needed, a detailed help document was available that users could access and print. The following were additional resources:

- FAQ – A frequently asked questions link was available for some of the most commonly asked questions during the pilot phase of the project.
- Water Quality Protection Catalog – A catalog of protection measures and available resources was available if users needed guidance.
- SIC Lookup – A lookup tool was included in the website that allowed users to view all the different types of potential threats of contamination, by SIC, to their water supply. The lookup guide referenced unregulated sites and was broken down by major categories.
- Technical Guidance – An informational guide on the basics of hydrology was included for educational purposes. The guide included information on diversion works, how potential sources of contamination could contaminate diversion points, and how best management practices are essential to safe drinking water.

- Related Resources – Additional sources of information pertaining to water resources and protecting our resources was available if users wanted more information. Some of the website links included EPA, USGS, DWR, Kansas Department of Agriculture, and many others.
- Resource Glossary – A comprehensive glossary explained all the terms and acronyms that were used throughout the website.
- Media Release Form – An example of a media release form and a template were provided to the PWS so they could notify the public about the assessment.

PART IV

PUBLIC INFORMATION

STRATEGY

PART IV

PUBLIC INFORMATION STRATEGY

A. OVERVIEW

The ultimate goal of SWAP is protection of Kansas's valuable drinking water resources. The best means of protection is prevention or avoidance of contamination; the results of which could lower overall water supply cost for the public. One of the best and most economical means to reach this ultimate goal is through education of the target audience including PWSs, community leaders, stakeholders, and the media.

B. INTERNET

A user friendly website was developed that allowed KDHE to share educational material on source water protection, verify existing information, and gather additional information from local source water assessment committees and PWSs. Also included in the website is a feedback link which PWSs can share information by submitting general comments, voice concerns, or ask particular questions about ASWAT if a problem arises. All feedback from PWSs was reviewed and responded to by KDHE or Burns & McDonnell. This feedback loop allowed both sides the opportunity to exchange information in an efficient manner and encouraged PWS participation. The website also included an Internet-based automated source water assessment tool, ASWAT, which allowed PWS to complete their SWA via the Internet. A detailed discussion of ASWAT is included in Part II of this report. Throughout the project, PWSs received updates, notices, information and educational material via the project website. Final SWAs are currently posted at www.kdhe.state.ks.us/SWAP/ for public viewing.

C. MAILERS

KDHE's PWS database was used to make initial contact, verify the project contacts and associated information including telephone and fax numbers, and mail and email addresses. KDHE's database was modified to include the new data. Initial PWS contact was made through a KDHE mass mailing. PWSs were asked to log into

ASWAT to register and complete the review of their SWA. PWSs without Internet access were given a contact person to request a hard copy of their preliminary SWA. The initial mailing provided an overview of the program and emphasized the importance of their participation.

D. TELEPHONE CONTACT

TAPs and various KDHE employees all took part in personally contacting PWSs in Kansas to establish lines of communication and commence the SWAP process. This was done in an effort to assist PWSs with any problems they might have encountered with ASWAT and field any questions that were not previously answered by the information on the Internet or in mailers. This was a great opportunity to promote PWS participation with their SWAs. Telephone contact proved most beneficial for those PWSs without Internet capabilities. This allowed TAPs and/or KDHE to mail them their SWA.

E. CONSUMER CONFIDENCE REPORTING (CCR)

The vulnerability assessment generated from the susceptibility analysis will be summarized in consumer confidence reports provided by the PWS. In January 2004, KDHE PWS Section will mail a letter to each PWS instructing them on CCR SWAP reporting requirements.

F. PRESS RELEASES

As more and more SWAs were completed, press releases could be issued by each PWS. A sample press release form was available on the website. Press releases provided the opportunity for the public to comment on the results of the SWA, voice their concerns, and highlight incorrect information or items that might have been forgotten. Press releases are beneficial to the public because they provide a good chance for the public to receive general information on potential pollution sources, BMPs, and watershed/wellhead protective measures in their communities. KDHE

will conduct a statewide press release to inform the public of SWA availability. This press release will be issued after EPA approves the final Kansas SWAP report.

PART V

FINDINGS

PART V

FINDINGS

A. OVERVIEW

This section of the report highlights the findings of the statistical analyses conducted on the SWA results. Two sets of statistical analyses are conducted. The first set evaluates susceptibility scores (SS) and the second evaluates non-regulatory and regulatory sources of potential contamination based on number of sites in the assessment area. The findings of the SS statistical analyses are based on the following three topics:

- Susceptibility scores.
- Population-weighted susceptibility scores.
- Susceptibility rankings.

These topics are further divided in the statistical analysis for groundwater, surface water, and a combination of the two (overall) on a statewide and an individual river basin basis.

B. SS (Susceptibility Score)

The SS is generated from the susceptibility analysis and indicates whether the susceptibility range is low, moderate, or high for potential threats of contamination in an assessment area. A low SS ranges from 0 to 50, a moderate SS ranges from 51 to 80, and a high SS ranges from 81 to 100. Each PWS received SSs in the following contaminant categories:

- Microbiological
- Nitrates (groundwater only)
- Pesticides
- Inorganic Compounds
- Synthetic Organic Compounds
- Volatile Organic Compounds
- Sedimentation (surface water only)
- Eutrophication – Phosphorous (surface water only)

Sedimentation, eutrophication, and phosphorous SSs do not apply to groundwater and are not calculated, as is the same for nitrates with surface water. SS for each contaminant category are averaged to develop the overall score for the PWS.

C. STATISTICAL ANALYSIS

1. Susceptibility Score Based Analysis

Statistical analyses are completed based on the SWA results for the following categories and subcategories as listed in Table V-1. Each of these analyses is completed for the total state and the 12 river basins. A complete list of the 12 major river basins in Kansas is included in the Appendix.

Table V-1
Statistical Analysis Categories

Category	Subcategory
Number of PWS	Total, groundwater, surface water, alluvial wells, and non-community systems
Population Served	Total, groundwater, surface water, alluvial wells, and non-community systems
PWS Susceptibility Score (percent) sorted for total, groundwater and surface water PWSs	Low, moderate and high susceptibility scores
Population Weighted Susceptibility Score (percent) sorted for total, groundwater and surface water PWSs	Low, moderate and high susceptibility scores
Susceptibility Rank sorted for overall, surface water and groundwater	Microbial, inorganic compounds, nitrates, eutrophication/phosphorus, sedimentation, synthetic organic compounds, pesticides, and volatile organic compounds

The first two categories, Number of PWS and Population Served, represent summary data for the state and each river basin. This data is used in the statistical analyses.

Several PWSs utilize both groundwater and surface water. The statistical analysis takes this into account when generating results for groundwater/surface water SSs, population-weighted SSs, and susceptibility rankings. For example, when a groundwater/surface water PWS exists in a river basin, the statistical analysis separates the groundwater results from the surface water results into their respective categories without changing the overall number of PWSs in that river basin.

Two PWS system types are considered in this analysis, community and non-community. Community systems often have permanent residents and therefore have a population. Community systems include cities, rural water districts, residential subdivisions, and apartment complexes. Non-community systems often have no permanent residents and therefore have no population data. Non-community systems include restaurants, churches, schools, rest areas, RV parks, campgrounds, mobile home parks, or other domain open to the public. Non-community SSs are not included in the statistical analysis because the results of the SSs, population-weighted SSs, susceptibility ranking for overall, groundwater, and surface water would be skewed.

2. Number of Sites Based Analysis

Non-regulatory and regulatory sources of potential contamination are evaluated to determine the top five in each category. The top six regulatory contamination sites are listed in Table V-2. This evaluation is conducted on a state-wide basis and for each river basin. Business Analyst is the database used for non-regulatory sources and various State databases are used for the regulatory portion of the evaluation.

Table V-2
Potential Regulatory Contamination Sites

Confined Animal Feeding Operations (CAFOs)
Hazardous Waste Facilities
Leaking Storage Tank Sites
Identified Contamination Sites
Solid Waste Facilities
Wastewater Facilities

D. CONCLUSIONS

The following discusses the results of the statistical analyses. Analysis results based on the SWA are shown in Figure V-1 and are listed in Table V-3.

1. PWS Susceptibility Score

On a statewide level, 54 percent of all PWSs received a low (0-50 range) susceptibility score, 45 percent received a moderate (51-80) score, and only 1 percent received a high (81-100) score. Amongst the 12 major river basins in Kansas, the Lower Arkansas had the least percentage, 41 percent, and number, 64 PWSs, receiving low scores and the Verdigris had the highest percentage at 75.

The Verdigris River basin had the lowest percentage of PWSs that received a moderate score at 25 percent. The Lower Arkansas and the Walnut river basins had the highest percentage at 58 percent. Ten out of 12 river basins had less than or equal to 1 percent of the PWSs receiving high scores. The Neosho and Marais des Cygnes river basins respectively had 5 and 8 percent of their PWSs receiving high scores.

a. Groundwater

On a statewide level, 54 percent of the 677 groundwater PWSs received a low score and 45 percent received a moderate score, and 1 percent received a high score. The Verdigris River basin has the highest percentage of groundwater

PWSs receiving low scores at 83 and the Walnut River basin has the lowest percentage at 22 percent.

Five of the river basins had 30 percent to 40 percent of their PWSs receive moderate scores. The Walnut River basin had the highest percentage of PWSs receive moderate scores at 78 percent and the Verdigris had the least at 17 percent. Every river basin had less than or equal to 1 percent of their PWSs receiving high scores.

b. Surface Water

On a statewide basis 51 percent of surface water PWSs received low scores, 43 percent received moderate scores, and 6 percent received high scores. The Cimarron and Upper Arkansas river basins do not have any surface water PWSs and are not included in this portion of the statistical analysis.

All of the PWSs in the Walnut River basin received low scores, while the three PWSs in the Upper Republican and the one PWS in the Solomon, received moderate scores. The Neosho River basin had the most PWSs receiving high scores at 16 percent. The Kansas Lower Republican and Marais des Cygnes river basins had 6 percent and 9 percent of their PWSs receive high scores. The remainder of the river basins had less than 1 percent in this range.

2. Population Weighted Susceptibility Score

This section includes the discussion on population weighted susceptibility scores for the state and the river basins. The population-weighted statistics reflect the susceptibility of small and large populations in an assessment area and indicate the percent of the population that are potentially vulnerable to a contamination incident.

On a statewide level, 24 percent of PWS population received a low score, 61 percent of the PWS population received moderate scores, and 16 percent received high scores. The decrease in low scores and increases in moderate and high scores is an indication that the population-weighted scores more accurately reflect the characteristics of the PWSs.

The Walnut River basin has the most PWS population with low scores at 93 percent and 7 percent received moderate scores. The Missouri River basin had the lowest PWS population receiving low scores at 7 percent and the most receiving moderate scores at 93 percent. The Kansas Lower Republican river basin had the highest PWS population receiving high scores at 38 percent. The Neosho, Lower Arkansas and Marais des Cygnes river basins respectively had 16 percent, 6 percent, and 9 percent of their PWSs receiving high scores, while the rest of the basins had less than 1 percent.

a. Groundwater

On a statewide basis, 36 percent of all groundwater PWS population received low scores, 63 percent received moderate scores, and 1 percent received high scores. The Verdigris River basin had the highest PWS population with low scores at 93 percent and the least amount of PWSs population with moderate scores at 7 percent. The Upper Republican River basin had the lowest PWS population with low scores at 16 percent and the highest PWS population with moderate scores at 84 percent. All river basins had 1 percent or of the PWS population receive high scores.

b. Surface Water

On a statewide basis, 10 percent of all surface water PWS population received low scores, 68 percent received moderate scores, and 22 percent received high scores. As previously mentioned, the Cimarron and Upper Arkansas river basins do not include any surface water PWSs and are not included in this portion of the statistical analysis.

The Walnut and Verdigris river basins had the highest PWS population with low scores at 100 and 73 percent, respectively. The remaining eight river basins all had less than 32 percent of their PWS population receive low scores. The Lower Republican, Missouri, Solomon, and Upper Republican river basins all had greater than 98 percent of their PWSs receive moderate scores. The Kansas Lower Republican had the highest PWS population receive a high score at 49 percent. The Neosho and Marais des Cygnes also had 14 percent and 13 percent of their PWS population receive high scores while the remainder of river basins received less than 1 percent.

3. Overall Susceptibility Rank

This section discusses the susceptibility ranking by contaminant categories as listed above in the SS description. On a statewide basis, volatile organic compounds had the highest SS for all PWSs. Synthetic organic compounds and microbiological agents ranked second and third, respectively. Eutrophication-phosphorous was ranked last.

All river basins except the Upper Republican ranked volatile organic compounds or synthetic organic compounds first or second in their SSs. The Upper Republican ranked nitrates and pesticides first and second, respectively.

4. Groundwater Susceptibility Rank

This section discusses the statistics for the groundwater systems. Sedimentation and eutrophication-phosphorous do not apply to groundwater PWSs and are not included in the rankings. On the statewide basis, volatile organic compounds ranked first in SSs followed by synthetic organic compounds and nitrates in second and third, respectively. Inorganic compounds ranked last in SSs.

Seven of the 12 river basins ranked volatile organic compounds first, two river basins ranked it as second, and three river basins ranked it as fourth. All river

basins ranked synthetic organic compounds or nitrates as second or third.

Microbiological agents or inorganic compounds were ranked as fifth or sixth for all river basins.

5. Surface Water Susceptibility Rank

This section discusses the final statistics for the surface water systems. Nitrates are typical to groundwater and do not typically enter surface water; therefore, they are not included in the rankings. The Cimarron and Upper Arkansas river basins do not contain any surface water PWS and were not included in this section of the analysis. On the statewide basis, sedimentation ranked first in SSs followed by eutrophication-phosphorous and synthetic organic compounds in second and third. Pesticides ranked last in SSs.

All river basins except Missouri and Walnut river basins ranked sedimentation or eutrophication-phosphorous as first or second. The Missouri and the Walnut ranked synthetic organic compounds first. All river basins ranked microbiological agents or pesticides as sixth or seventh in SSs.

Statistical analyses were also conducted on the non-regulatory and regulatory data based on the number of sites in the assessment area as listed in Table V-4.

Review of Table V-4 shows single family housing is the highest potential non-regulatory source of contamination in the state as well as in the Kansas Lower Republican, Marais des Cygnes, Missouri, Smoky Hill Saline, Upper Arkansas, and Walnut river basins. Nine out of 12 river basins ranked auto truck repair facilities the second largest with the highest counts in the Neosho, Upper Republican, and Verdigris river basins.

Regulatory sources typically include leaking underground storage tanks (LUST), wastewater plants, registered confined animal feed lots (CAFO), solid waste sites, and identified contaminant sites. Review of Table V-4 shows LUSTs are the

highest count in the state and in six river basins. Wastewater plants are second
highest count in the state and first in four river basins.

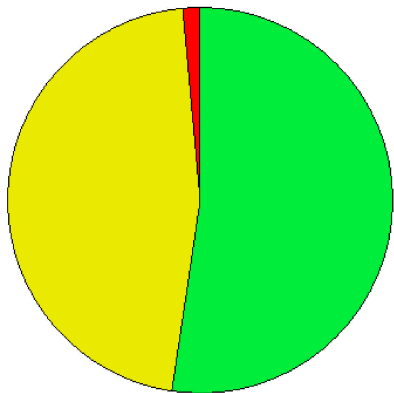
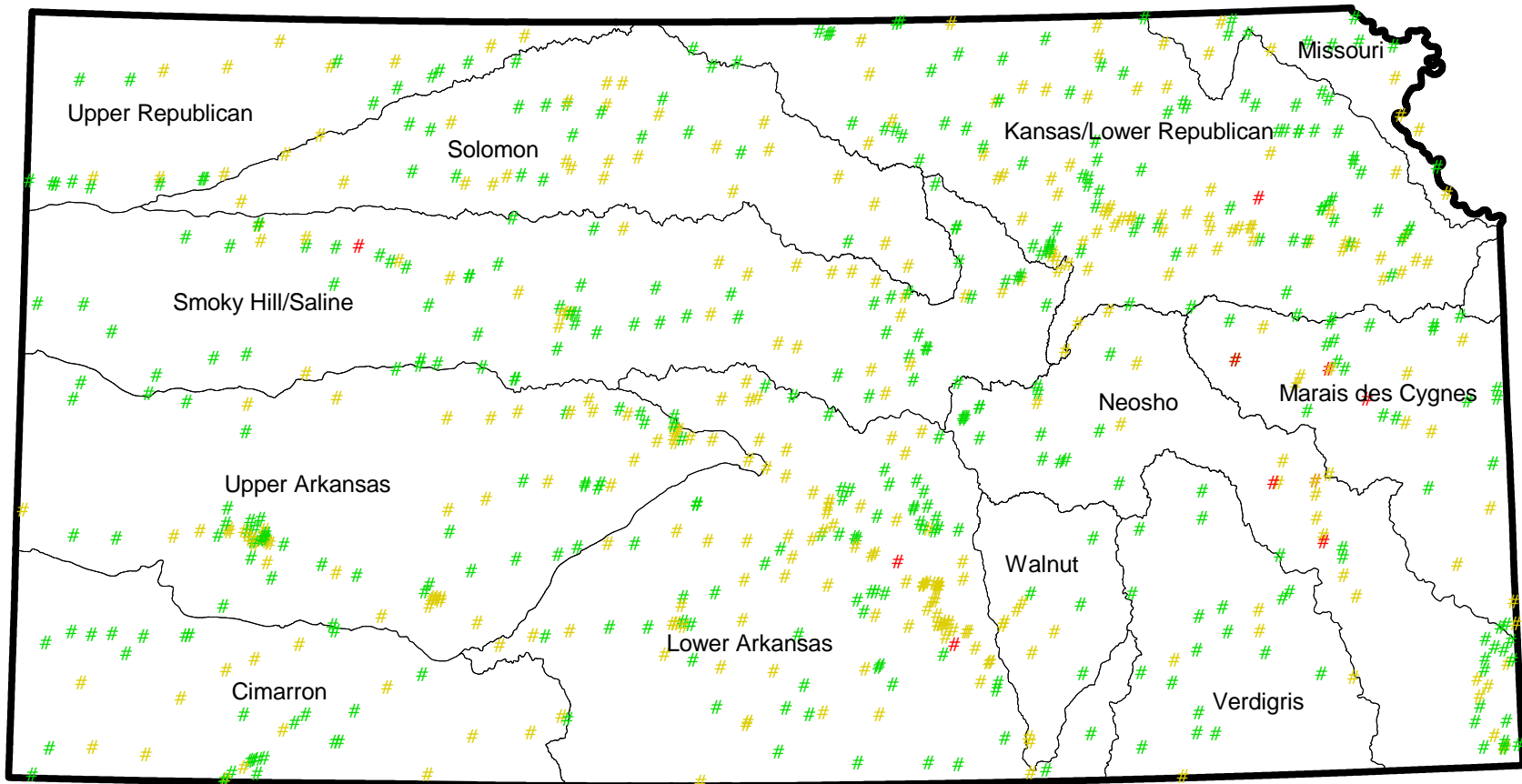
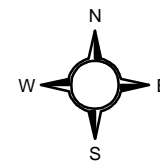


Chart and Map Legend

- # 54% Low (0 - 50)
- # 45% Moderate (51 - 80)
- # 1% High (81 - 100)



40 0 40 80 Miles

Table V-3
Statistical Analysis Summary

Category	SubCategory	State	Neosho	Cimarron	Kansas/Lower Republican	Lower Arkansas	Marais des Cygnes	Missouri	Smoky Hill/Saline	Solomon	Upper Arkansas	Upper Republican	Verdigris	Walnut
1. Number of PWS	a. Total	762	56	41	150	157	40	17	97	44	96	28	24	12
	b. Groundwater	675	37	41	133	157	18	14	94	42	96	28	6	9
	c. Surface Water	96	19	0	16	3	22	4	6	3	0	1	19	3
	d. Alluvial Wells	11	1	0	8	0	1	1	0	0	0	0	0	0
	e. Non-Community	177	7	15	20	58	2	1	22	4	33	9	3	3
2. Population Served	a. Total	2,355,034	144,015	46,429	883,791	587,084	79,411	237,733	120,543	28,391	115,940	22,393	50,278	39,026
	b. Groundwater	1,184,720	54,552	46,429	140,794	587,084	13,596	60,557	115,057	23,108	115,940	22,393	1,415	3,795
	c. Surface Water	1,576,920	93,065		679,310	372,832	63,848	216,647	56,553	6,938		3,103	49,393	35,231
	d. Alluvial Wells	748,991	962		581,167		2,400	164,462						
	e. Non-Community	0	0	0	0	0	0	0	0	0	0	0	0	0
4. PWS Susceptibility Score (%):	a. Low 0-50	54	57	63	57	41	55	59	66	43	50	57	75	42
	b. Moderate 51-80	45	38	37	42	58	38	41	33	57	50	43	25	58
	c. High 81-100	1	5	0	1	1	8	0	1	0	0	0	0	0
5. PWS Susceptibility Score for Groundwater (%):	a. Low 0-50	54	68	63	59	41	67	64	66	45	50	57	83	22
	b. Moderate 51-80	45	32	37	41	58	33	36	33	55	50	43	17	78
	c. High 81-100	0	0	0	0	1	0	0	1	0	0	0	0	0
6. PWS Susceptibility Score for Surface Water (%):	a. Low 0-50	51	32	NA	63	33	45	25	67	0	NA	0	74	100
	b. Moderate 51-80	43	53	NA	31	67	45	75	33	100	NA	100	26	0
	c. High 81-100	6	16	NA	6	0	9	0	0	0	NA	0	0	0
7. Population Weighted Susceptibility Score (%):	a. Low	24	33	75	13	23	40	7	26	34	62	16	73	93
	b. Moderate	61	58	25	50	76	46	93	74	66	38	84	27	7
	c. High	16	9	0	38	2	14	0	0	0	0	0	0	0
8. Population Weighted Susceptibility Score for Groundwater (%):	a. Low	36	46	75	68	23	83	25	24	41	62	16	93	29
	b. Moderate	63	54	25	32	76	17	75	75	59	38	84	7	71
	c. High	1	0	0	0	2	0	0	0	0	0	0	0	0
9. Population Weighted Susceptibility Score for Surface Water (%):	a. Low	10	24	0	4	2	32	1	14	0	0	0	73	100
	b. Moderate	68	62	0	48	98	55	99	86	100	0	100	27	0
	c. High	22	14	0	49	0	13	0	0	0	0	0	0	0
16. Overall Susceptibility Rank	a. Microbial	3	3	6	3	3	4	3	5	3	6	6	4	3
	b. Inorganic Compounds	5	4	5	5	5	3	4	6	6	5	5	3	4
	c. Nitrates	6	6	3	6	4	8	6	4	5	3	1	8	6
	d. Eutrophication/Phosphorous	8	8	7	8	7	7	8	7	8	7	8	7	7
	e. Sedimentation	7	7	8	7	8	6	7	8	7	8	7	6	8
	f. Synthetic Organic Compounds	2	2	2	1	2	2	1	2	1	2	3	1	1
	g. Pesticides	4	5	4	4	6	5	5	3	4	4	2	5	5
	h. Volatile Organic Compounds	1	1	1	2	1	1	2	1	2	1	4	2	2
17. Surface Water Susceptibility Rank	a. Microbial	6	6	NA	6	6	6	4	5	7	NA	6	6	7
	b. Inorganic Compounds	5	5	NA	5	7	5	3	6	6	NA	5	5	5
	c. Eutrophication/Phosphorous	2	2	NA	1	1	2	6	1	2	NA	7	3	3
	d. Sedimentation	1	1	NA	2	2	1	5	2	1	NA	1	1	4
	e. Synthetic Organic Compounds	3	4	NA	3	5	3	1	3	3	NA	2	2	1
	f. Pesticides	7	7	NA	7	4	7	7	7	5	NA	4	7	6
	g. Volatile Organic Compounds	4	3	NA	4	3	4	2	4	4	NA	3	4	2
18. Groundwater Susceptibility Rank	a. Microbial	5	3	6	5	3	3	2	5	4	6	6	3	1
	b. Inorganic Compounds	6	6	5	6	5	6	6	6	5	5	5	6	6
	c. Nitrates	3	4	3	3	4	2	1	3	3	3	1	4	3
	d. Synthetic Organic Compounds	2	2	2	1	2	4	3	2	1	2	3	2	2
	e. Pesticides	4	5	4	4	6	5	5	4	5	4	2	5	5
	f. Volatile Organic Compounds	1	1	1	2	1	1	4	1	2	1	4	1	4

Table V-4
Contaminant Statistical Summary

	Non-Regulatory					Regulatory				
Ranking for No. of times sources found within AA*	1	2	3	4	5	1	2	3	4	5
STATE - Kansas										
Potential Source of Contamination	Single-family Housing Construction	Auto Truck Repair Service	Top, Body, and Upholstery Repair Shops and Paint Shops	Veterinary Services, Specialties	Gasoline Service Station	Leaking Underground Storage Tank Sites	Wastewater Facilities	Confined Animal Feed Lots	Identified Contaminant Sites	Solid Waste Facilities
No. of times sources are found within AA*	3778	3216	1659	1488	1358	7430	4824	3809	2045	1761
No. of PWS with contaminant	300	327	236	213	246	357	571	396	277	262
Percent of PWS that have contaminant	39%	43%	31%	28%	32%	47%	75%	52%	36%	34%
CI - Cimarron										
Potential Source of Contamination	Oil and Gas Field services	Auto Truck Repair Service	Single-family Housing Construction	Top, Body, and Upholstery Repair Shops and Paint Shops	Gasoline Service Station	Leaking Underground Storage Tank Sites	Identified Contaminant Sites	Wastewater Facilities	Solid Waste Facilities	Confined Animal Feed Lots
No. of times sources are found within AA*	250	128	74	64	63	99	80	55	24	12
No. of PWS with contaminant	13	14	10	11	9	21	13	26	10	11
Percent of PWS that have contaminant	32%	34%	24%	27%	22%	51%	32%	63%	24%	27%
KR - KansasLower Republican										
Potential Source of Contamination	Single-family Housing Construction	Auto Truck Repair Service	Veterinary Services, Specialties	Top, Body, and Upholstery Repair Shops and Paint Shops	Repair Services, Nec	Leaking Underground Storage Tank Sites	Wastewater Facilities	Confined Animal Feed Lots	Identified Contaminant Sites	Solid Waste Facilities
No. of times sources are found within AA*	1928	1278	664	577	643	3754	2149	1566	946	789
No. of PWS with contaminant	69	59	45	46	38	70	125	86	51	50
Percent of PWS that have contaminant	46%	39%	30%	30%	25%	46%	83%	57%	34%	33%
LA - Lower Arkansas										
Potential Source of Contamination	Single-family Housing Construction	Auto Truck Repair Service	Top, Body, and Upholstery Repair Shops and Paint Shops	Veterinary Services, Specialties	Gasoline Service Station	Wastewater Facilities	Leaking Underground Storage Tank Sites	Confined Animal Feed Lots	Identified Contaminant Sites	Solid Waste Facilities
No. of times sources are found within AA*	415	392	176	160	147	488	467	314	192	112
No. of PWS with contaminant	69	69	45	32	47	68	55	68	53	43
Percent of PWS that have contaminant	44%	44%	29%	20%	30%	81%	35%	43%	34%	27%
MC - Marais des Cygnes										
Potential Source of Contamination	Single-family Housing Construction	Auto Truck Repair Service	Veterinary Services, Specialties	Repair Services, Nec	Top, Body, and Upholstery Repair Shops and Paint Shops	Confined Animal Feed Lots	Wastewater Facilities	Leaking Underground Storage Tank Sites	Solid Waste Facilities	Identified Contaminant Sites
No. of times sources are found within AA*	133	122	85	62	55	399	331	198	44	33
No. of PWS with contaminant	16	18	10	13	10	16	26	8	15	12
Percent of PWS that have contaminant	40%	45%	25%	33%	25%	40%	65%	20%	38%	30%
MO - Missouri										
Potential Source of Contamination	Single-family Housing Construction	Auto Truck Repair Service	Top, Body, and Upholstery Repair Shops and Paint Shops	Newspapers Publishing and Printing	Veterinary Services, Specialties	Identified Contaminant Sites	Wastewater Facilities	Leaking Underground Storage Tank Sites	Confined Animal Feed Lots	Solid Waste Facilities
No. of times sources are found within AA*	136	122	72	45	43	141	138	111	82	79
No. of PWS with contaminant	9	8	8	9	8	11	11	5	14	6
Percent of PWS that have contaminant	53%	47%	47%	53%	53%	47%	65%	29%	82%	35%
NE - Neosho										
Potential Source of Contamination	Auto Truck Repair Service	Single-family Housing Construction	Top, Body, and Upholstery Repair Shops and Paint Shops	Veterinary Services, Specialties	Gasoline Service Station	Wastewater Facilities	Confined Animal Feed Lots	Solid Waste Facilities	Leaking Underground Storage Tank Sites	Identified Contaminant Sites
No. of times sources are found within AA*	261	246	161	110	107	669	527	334	207	201
No. of PWS with contaminant	28	27	22	22	21	45	31	31	26	21
Percent of PWS that have contaminant	50%	48%	39%	39%	38%	80%	55%	55%	46%	38%
SO - Solomon										
Potential Source of Contamination	Farm Product Warehousing and Storage	Auto Truck Repair Service	General Farm, Primarily Crop	Single-family Housing Construction	Top, Body, and Upholstery Repair Shops and Paint Shops	Leaking Underground Storage Tank Sites	Confined Animal Feed Lots	Wastewater Facilities	Identified Contaminant Sites	Solid Waste Facilities
No. of times sources are found within AA*	81	75	46	44	43	324	248	107	31	21
No. of PWS with contaminant	21	17	9	13	13	31	28	28	14	7
Percent of PWS that have contaminant	48%	39%	20%	30%	30%	70%	64%	64%	32%	16%
SS - Smoky Hill/Saline										
Potential Source of Contamination	Single-family Housing Construction	Auto Truck Repair Service	Oil and Gas Field services	Top, Body, and Upholstery Repair Shops and Paint Shops	Repair Services, Nec	Leaking Underground Storage Tank Sites	Confined Animal Feed Lots	Wastewater Facilities	Identified Contaminant Sites	Solid Waste Facilities
No. of times sources are found within AA*	375	357	345	195	175	1469	402	355	243	90
No. of PWS with contaminant	25	34	18	28	21	64	59	64	33	32
Percent of PWS that have contaminant	26%	35%	19%	29%	22%	66%	61%	66%	34%	33%
UA - Upper Arkansas										
Potential Source of Contamination	Single-family Housing Construction	Auto Truck Repair Service	Top, Body, and Upholstery Repair Shops and Paint Shops	Veterinary Services, Specialties	Oil and Gas Field services	Leaking Underground Storage Tank Sites	Wastewater Facilities	Solid Waste Facilities	Confined Animal Feed Lots	Identified Contaminant Sites
No. of times sources are found within AA*	325	315	189	180	178	741	254	187	131	102
No. of PWS with contaminant	42	50	38	32	25	56	70	46	50	53
Percent of PWS that have contaminant	43%	52%	39%	33%	26%	58%	72%	47%	52%	55%
UR - Upper Republican										
Potential Source of Contamination	Auto Truck Repair Service	Farm Product Warehousing and Storage	Farm and Garden Machinery	Top, Body, and Upholstery Repair Shops and Paint Shops	Gasoline Service Station	Leaking Underground Storage Tank Sites	Wastewater Facilities	Confined Animal Feed Lots	Identified Contaminant Sites	Solid Waste Facilities
No. of times sources are found within AA*	86	47	37	34	34	102	56	49	22	20
No. of PWS with contaminant	12	13	8	8	9	12	23	17	9	9
Percent of PWS that have contaminant	43%	46%	29%	29%	32%	43%	82%	61%	32%	32%
VE - Verdigris										
Potential Source of Contamination	Auto Truck Repair Service	Single-family Housing Construction	Gasoline Service Station	Top, Body, and Upholstery Repair Shops and Paint Shops	General Farm, Primarily Crop	Wastewater Facilities	Confined Animal Feed Lots	Solid Waste Facilities	Identified Contaminant Sites	Leaking Underground Storage Tank Sites
No. of times sources are found within AA*	70	63	30	26	23	177	68	56	49	16
No. of PWS with contaminant	11	7	10	6	8	15	9	10	6	8
Percent of PWS that have contaminant	46%	29%	42%	25%	33%	63%	38%	42%	25%	33%
WA - Walnut										
Potential Source of Contamination	Single-family Housing Construction	Auto Truck Repair Service	Veterinary Services, Specialties	Sporting and Recreational Camps	Repair Services, Nec	Wastewater Facilities	Confined Animal Feed Lots	Solid Waste Facilities	Identified Contaminant Sites	Leaking Underground Storage Tank Sites
No. of times sources are found within AA*	15	10	9	5	4	45	11	5	5	2
No. of PWS with contaminant	7	7	4	3	4	11	7	3	4	1
Percent of PWS that have contaminant	58%	58%	33%	25%	33%	92%	58%	25%	33%	8%

* No. of times sources are found within AA. This does not mean the total number of sources. This means that a single source could count as 2 if it is in 2 different AA or 10 if it is in 10 different AA.

PART VI

FUTURE SOURCE WATER

PROTECTION PLANNING

EFFORTS

PART VI

FUTURE SOURCE WATER PROTECTION PLANNING EFFORTS

A. OVERVIEW

Protection of drinking water resources in Kansas is the ultimate goal of the SWAP. The best way to achieve this is by prevention – minimize or avoid potential for source water contamination. This is, and should continue to be, the foundation for future source water protection efforts. Future source water protection planning efforts will include the development of water quality corrective measures plans and the eventual implementation of water quality protective measures. This will require verification of potential contamination source inventories.

The turnover rate for potential contaminant sources can be frequent; therefore, these inventories will need to be continually updated to determine the potential impact on existing water sources. Additionally, a SWA should be completed as existing sources are expanded, new water sources developed, and old water sources abandoned.

KDHE will encourage PWSs to use their SWAs to complete source water protection plans, on a voluntary basis. State and federal resources will be targeted to SWA areas and PWSs with medium and high SSs.

B. SOURCE WATER PROTECTION PLAN DEVELOPMENT

The development of a source water protection plan will involve several efforts: assessment area refinement, contaminant source verification, public involvement, and information and education efforts. Accurate assessment area information is essential in the development process. With cities and towns across Kansas growing in land area and population, the need for accurate information is increasingly important. Municipalities will be asked to provide more water to support the demands of growth and may have to resort to new source water areas. Therefore, it is vitally important to have accurate assessment area information. KDHE will work to provide wellhead protection area modeling tools and technical assistance to help refine AAs in the future.

Public involvement should never cease in the development of a source water protection plan. Public involvement allows anyone to voice concerns and add beneficial input. Public involvement also provides an excellent opportunity to display and distribute information and educate the public on potential threats to their water supply sources and the vulnerability of their water source to contamination. By doing so, the public will be encouraged to help safeguard Kansas's valuable drinking water resources.

Continued support from TAPs is important for informational and educational reasons. TAPs are an excellent tool to bridge the gap between state and local levels. Further assistance of TAPs can aid in the development of a source water protection plan by keeping PWSs informed and educated on contamination threats and regulatory issues, both state and local. By offering their knowledge on BMPs, diversion works, or pollution sources, PWSs can prepare their water quality corrective measure plan and mitigate unforeseen dilemmas. TAPs must continue to keep these lines of communication open to actively encourage PWSs to stay involved and continue through plan development, plan implementation and maintenance of the plan.

Keeping accurate and recent assessment area information, promoting public involvement, and continued involvement from TAPs are important source water protection efforts that can be made to develop a water quality corrective measures plan and the eventual implementation and maintenance of water quality protective measures.

APPENDIX A

PWS LIST

Kansas Public Water Supplies

PWS No.	PWS System	PWS No.	PWS System
1200	2 LIONS DEVELOPMENT	1101	CALDWELL, CITY OF
1267	4-U MOBILE HOME PARK	1779	CAMP HAWK
1278	ABBYVILLE, CITY OF	1485	CAMP INNS TRAILER PARK
1762	ABILENE, CITY OF	1759	CAMP KANZA
1126	AGRA, CITY OF	1494	CAMP WIEDEMANN
1537	AIR PRODUCTS and CHEMICALS	1734	CANEY, CITY OF
1256	ALBERT, CITY OF	1173	CANTON, CITY OF
1606	ALDEN ATTENDANCE CENTER USD 376	1192	CAPALDO WATER ASSOCIATION
1430	ALEXANDER, CITY OF	1778	CAPROCK INDUSTRIES
1112	ALL SEASONS CAMPGROUND	1692	CARBONDALE, CITY OF
1420	ALL SEASONS MOBILE HOME COURT	1677	CASEYS GENERAL STORE 1869
1697	ALMA, CITY OF	1285	CAWKER CITY, CITY OF
1141	ALMENA, CITY OF	1525	CEDAR BLUFF S SHORE WATER SUPPLY
1026	ALTA VISTA, CITY OF	1007	CEDAR POINT, CITY OF
1083	ALTON, CITY OF	1801	CEDAR VALE, CITY OF
1715	ALTOONA, CITY OF	1277	CENTRE ELEMENTARY SCHOOL-USD 397
1528	AM LEWIS CONFERENCE CTR - PECUSA	1281	CENTRE HIGH SCHOOL-USD 397
1672	ANDALE, CITY OF	1751	CHANUTE, CITY OF
1737	ANDERSON CO RWD 2	1050	CHAPMAN, CITY OF
1090	ANTHONY, CITY OF	1049	CHASE, CITY OF
1338	APPANOOSE SCHOOL-USD 287	1765	CHENEY LANES, INC.
1193	ARCADIA, CITY OF	1496	CHENEY STATE PARK HEIMERMAN PT
1105	ARGONIA, CITY OF	1794	CHENEY STATE PARK M and M POINT
1318	ARKANSAS CITY, CITY OF	1104	CHENEY, CITY OF
1065	ARLINGTON, CITY OF	1073	CHEROKEE CO RWD 1
1352	ARMA, CITY OF	1350	CHEROKEE CO RWD 2
1435	ARNOLD WATERWORKS INC	1072	CHEROKEE CO RWD 3
1097	ASHLAND, CITY OF	1331	CHEROKEE CO RWD 4
1164	ASSARIA, CITY OF	1195	CHEROKEE CO RWD 8
1707	ATCHISON, CITY OF	1333	CHEROKEE CO RWD 9
1001	ATTICA, CITY OF	1354	CHEROKEE, CITY OF
1380	ATWOOD, CITY OF	1733	CHETOPA, CITY OF
1763	AUGUSTA MUNICIPAL AIRPORT	1476	CIMARRON RECREATION AREA
1223	AUGUSTA, CITY OF	1438	CIMARRON, CITY OF
1176	AURORA, CITY OF	1381	CLAFLIN, CITY OF
1510	AXTELL, CITY OF	1158	CLAY CENTER, CITY OF
1519	B and B OVERNITE CAMP	1175	CLAY CO RWD 1
1612	B Js 66	1647	CLAY CO RWD 2
1450	BARBER CO RWD 2	1405	CLAYTON, CITY OF
1451	BARBER CO RWD 3	1316	CLEARWATER, CITY OF
1088	BARNES, CITY OF	1048	CLIFTON, CITY OF
1363	BARTON CO RWD 2	1689	CLINTON RESERVOIR
1481	BARTON COUNTY COMMUNITY COLLEGE	1791	CLOUD CERAMICS
1460	BARTON HILLS ADDITION	1395	CLOUD CO RWD 1
1074	BAXTER SPRINGS, CITY OF	1043	CLYDE, CITY OF
1134	BAZINE, CITY OF	1262	COATS, CITY OF
1310	BED ROCK MOBILE HOME PARK	1735	COFFEYVILLE, CITY OF
1004	BELLE PLAINE, CITY OF	1115	COLBY, CITY OF
1087	BELLEVILLE, CITY OF	1092	COLDWATER, CITY OF
1678	BELOIT, CITY OF	1566	COLEMAN COMPANY INC
1443	BELPRE, CITY OF	1411	COLLYER, CITY OF
1290	BELVUE, CITY OF	1787	COLORADO INTERSTATE GAS
1153	BENNINGTON, CITY OF	1332	COLUMBUS, CITY OF
1464	BERN, CITY OF	1497	COLWICH ELEM SCHOOL-USD 267
1140	BEVERLY, CITY OF	1013	COLWICH HEALTH CENTER
1309	BIG BOW SCHOOL-USD 452	1803	COLWICH, CITY OF
1121	BIRD CITY, CITY OF	1554	COMANCHE CO RWD 2
1771	BISHOP SEABURY ACADEMY	1275	CON AGRA BEEF CO
1375	BISON, CITY OF	1169	CONCORDIA, CITY OF
1222	BLASI DAY CARE	1769	CONTI BEEF, LLC
1719	BLUE MOUND, CITY OF	1113	CONWAY SPRINGS, CITY OF
1294	BLUE RAPIDS, CITY OF	1300	COOLIDGE, CITY OF
1611	BLUE RIVER HILLS IMPVMT DISTRICT	1480	COPELAND, CITY OF
1015	BLUFF CITY, CITY OF	1710	COTTONWOOD FALLS, CITY OF
1136	BOGUE, CITY OF	1357	COTTONWOOD MOBILE HOME PARK
1149	BONNER SPRINGS, CITY OF	1679	COUNCIL GROVE, CITY OF

Kansas Public Water Supplies

PWS No.	PWS System	PWS No.	PWS System
1368	BREWSTER, CITY OF	1597	COUNTRY VIEW MOBILE HOME PARK
1335	BROKEN ARROW RANCH	1573	COUNTRYSIDE CHRISTIAN SCHOOL
1040	BROWN CO RWD 1	1359	COUNTRYSIDE RENTALS
1429	BROWNELL, CITY OF	1662	COUNTRYVIEW MOBILE HOME PARK
1440	BUCKLIN, CITY OF	1504	COWLEY CO RWD 1
1552	BUFFALO DUNES GOLF COURSE	1017	COWLEY CO RWD 3
1129	BUFFALO HILLS PARK	1018	COWLEY CO RWD 6
1742	BUFFALO, CITY OF	1194	CRAWFORD CO RWD 1
1063	BUHLER, CITY OF	1349	CRAWFORD CO RWD 1C
1365	BUNKER HILL, CITY OF	1493	CRAWFORD CO RWD 3
1201	BURDETT, CITY OF	1356	CRAWFORD CO RWD 4
1746	BURLINGTON, CITY OF	1492	CRAWFORD CO RWD 5
1279	BURNS, CITY OF	1165	CUBA, CITY OF
1086	BURR OAK, CITY OF	1302	CULLISON, CITY OF
1051	BURRTON, CITY OF	1182	CULVER, CITY OF
1393	BUSHTON, CITY OF	1095	CUNNINGHAM, CITY OF
1445	DEERFIELD, CITY OF	1608	GEARY CO RWD 4
1632	DELIA, CITY OF	1402	GEARY CO WD 2
1045	DELPHOS, CITY OF	1392	GENESEO, CITY OF
1225	DESOTO, CITY OF	1564	GEUDA SPRINGS, CITY OF
1639	DESOTO, CITY OF - SFAAP	1076	GIRARD, CITY OF
1010	DEXTER, CITY OF	1427	GLADE, CITY OF
1664	DIAMONDS	1284	GLEN ELDER, CITY OF
1644	DICKINSON CO RWD 1	1111	GODDARD, CITY OF
1315	DIGHTON, CITY OF	1103	GOESSEL, CITY OF
1258	DODGE CITY, CITY OF	1125	GOODLAND, CITY OF
1594	DOONAN TRUCK and EQUIPMENT	1413	GOVE, CITY OF
1138	DORRANCE, CITY OF	1377	GRAINFIELD, CITY OF
1234	DOUGLAS CO RWD 3 (TRI-DISTRICT)	1782	GREAT BEND INDUSTRIAL PARK
1565	DOUGLASS, CITY OF	1426	GREAT BEND PACKING
1084	DOWNES, CITY OF	1428	GREAT BEND, CITY OF
1109	DURHAM, CITY OF	1355	GREELEY, CITY OF
1660	DUTCH KITCHEN	1584	GREEN ACRES MOBILE HOME COURT
1398	DWIGHT, CITY OF	1400	GREEN, CITY OF
1587	EAST GARDEN MOBILE HOME COURT	1469	GREENLEAF, CITY OF
1620	EASTON, CITY OF	1295	GREENSBURG, CITY OF
1592	EASTSIDE COUNTRY STORE	1738	GRENOLA, CITY OF
1547	EASTSIDE MOBILE HOME PARK	1369	GRINNELL, CITY OF
1190	EBERLY FARM INC	1202	GUNSMOKE TRAV-L-PARK
1070	EFFINGHAM, CITY OF	1160	GYPSUM, CITY OF
1712	EL DORADO, CITY OF	1166	HADDAM, CITY OF
1282	EL PASO WATER COMPANY	1009	HALSTEAD, CITY OF
1345	ELGIN, CITY OF	1313	HAMILTON CO RWD 1
1721	ELK CITY, CITY OF	1367	HANSEN BSA CAMP @ KIRWIN
1415	ELKHART, CITY OF	1475	HANSTON, CITY OF
1422	ELLINWOOD, CITY OF	1452	HARDTNER, CITY OF
1409	ELLIS CO RWD 3	1016	HARPER CO RWD 3
1253	ELLIS CO RWD 6	1089	HARPER, CITY OF
1246	ELLIS, CITY OF	1665	HARVEY CO WEST PARK-EAST WELL 2
1680	ELLSWORTH CO RWD 1	1676	HARVEY CO WEST PARK-WEST WELL 1
1293	ELLSWORTH, CITY OF	1705	HARVEYVILLE, CITY OF
1107	ELMDALE, CITY OF	1066	HAVEN, CITY OF
1795	ELYRIA CHRISTIAN SCHOOL	1270	HAVILAND, CITY OF
1466	EMMETT, CITY OF	1758	HAWKS LANDING
1347	EMPIRE DISTRICT ELECTRIC COMPANY	1562	HAYS SUBURBAN ESTATES
1716	EMPORIA, CITY OF	1248	HAYS, CITY OF
1099	ENGLEWOOD, CITY OF	1283	HAYSVILLE, CITY OF
1448	ENSIGN, CITY OF	1539	HEART MINISTRIES
1394	ENTERPRISE, CITY OF	1756	HEARTLAND CHRISTIAN SCHOOL
1730	ERIE, CITY OF	1790	HEARTLAND COMMUNITY CHURCH
1467	ESBON, CITY OF	1777	HERINGTON AIRPORT
1687	ESKRIDGE, CITY OF	2001	HERINGTON, CITY OF
1217	EUDORA, CITY OF	1120	HERNDON, CITY OF
1729	EUREKA, CITY OF	1012	HESSTON, CITY OF
1336	EVEREST, CITY OF	1038	HIAWATHA, CITY OF
1212	EVERGREEN MOTEL	1034	HIGHLAND, CITY OF

Kansas Public Water Supplies

PWS No.	PWS System	PWS No.	PWS System
1447	EXCEL CORP	1376	HILL CITY, CITY OF
1674	FAIRFIELD HIGH SCHOOL-USD 310	1358	HILLCREST CTS/J and J TR PRK
1328	FALL RIVER RES WHITEHALL BAY WS	1681	HILLSBORO, CITY OF
1585	FARMLAND INDUSTRIES INC	1804	HITCH FEEDERS MOBILE HOME PARK
1555	FARMLAND NATIONAL BEEF - LIBERAL	1524	HOISINGTON, CITY OF
1188	FARR RENTALS @HOLCOMB	1261	HOLCOMB, CITY OF
1474	FINNEY CO RWD 1	1752	HOLTON, CITY OF
1108	FLORENCE, CITY OF	1167	HOLYROOD, CITY OF
1218	FONTANA, CITY OF	1774	HORACE, CITY OF
1271	FORD, CITY OF	1625	HORTON, CITY OF
1627	FORT LEAVENWORTH	1713	HOWARD, CITY OF
1239	FORT RILEY	1515	HOWISON HEIGHTS WATER DISTRICT
1743	FORT SCOTT, CITY OF	1255	HOXIE, CITY OF
1556	FOSTERS RV PARK LLC (AKA KOA)	1582	H-PARK MOBILE HOME PARK
1649	FOUR SEASONS RV ACRES	1553	HUDSON MIDDLE SCHOOL-USD 350
1444	FOWLER, CITY OF	1214	HUGOTON, CITY OF
1509	FRANKFORT, CITY OF	1749	HUMBOLDT, CITY OF
1588	FRANKLIN CO RWD 4	1603	HUNTERS CLUB
1033	FRANKLIN CO RWD 5	1064	HUTCHINSON, CITY OF
1228	FRANKLIN CO RWD 6	1543	IBP INC
1747	FREDONIA, CITY OF	1736	INDEPENDENCE, CITY OF
1655	FREE BREAKFAST INN	1441	INGALLS, CITY OF
1327	FRONTENAC, CITY OF	1180	INMAN, CITY OF
1616	FT LARNED NATIONAL HISTORIC SITE	1748	IOLA, CITY OF
1637	FT LARNED PICNIC AREA	1446	ISABEL, CITY OF
1326	FULTON, CITY OF	1308	IUKA, CITY OF
1078	GALENA, CITY OF	1540	JACKSON CO RWD 3
1174	GALVA, CITY OF	1396	JAMESTOWN, CITY OF
1186	GARDEN CITY AIRPORT	1236	JEFFERSON CO RWD 1
1442	GARDEN CITY, CITY OF	1233	JEFFERSON CO RWD 10
1106	GARDEN PLAIN, CITY OF	1755	JEFFERSON CO RWD 11
1549	GARDEN SPOT RENTALS	1340	JEFFERSON CO RWD 12
1574	GARDEN VIEW CHRISTIAN SCHOOL	1623	JEFFERSON CO RWD 13
1708	GARDNER, CITY OF	1031	JEFFERSON CO RWD 15
1423	GAYLORD, CITY OF	1030	JEFFERSON CO RWD 2
1341	JEFFERSON CO RWD 3	1704	LOUISBURG, CITY OF
1041	JEFFERSON CO RWD 7	1378	LUCAS, CITY OF
1542	JEFFERSON CO RWD 9	1696	LYNDON, CITY OF
1550	JENNIE BARKER ELEM SCHL USD 457	1060	LYONS, CITY OF
1374	JENNINGS, CITY OF	1401	M and M MOBILE HOME COURT
1805	JETMORE MOTORPLEX	1146	MACKSVILLE, CITY OF
1273	JETMORE, CITY OF	1330	MADISON, CITY OF
1404	JEWELL CO RWD 1	1155	MAHASKA, CITY OF
1654	JJ OIL CO	1575	MAIZE PIZZA HUT
1770	JJs CORNER	1243	MANHATTAN, CITY OF
1241	JOHNS MOBILE HOME COURT	1417	MANKATO, CITY OF
1301	JOHNSON CITY, CITY OF	1268	MANTER, CITY OF
1604	JOHNSTON TRAILER COURT	1227	MAPLE HILL, CITY OF
1056	JUNCTION CITY, CITY OF	1303	MARIENTHAL CHRISTIAN SCHOOL
1513	KANOP-O-LANES TRAILER COURT	1100	MARION CO RWD 1
1168	KANOPOLIS, CITY OF	1682	MARION, CITY OF
1135	KANORADO, CITY OF	1055	MARQUETTE, CITY OF
1724	KANSAS ARMY AMMUNITION PLANT	1042	MARSHALL CO RWD 2
1657	KANSAS BIBLE CAMP	1037	MARSHALL CO RWD 3
1695	KANSAS CITY BD OF PUBLIC UTILS	1023	MARYSVILLE, CITY OF
1299	KANSAS SOLDIERS HOME	1383	MATFIELD GREEN, CITY OF
1741	KCPandL - LACYGNE UNITS 1 and 2	1373	MCCRACKEN, CITY OF
1522	KDOT-CIMARRON RVR RST AR 6-4505	1530	MCDONALD, CITY OF
1559	KDOT-COLBY REST AREA EB 3-2512	1629	MCFARLAND, CITY OF
1558	KDOT-COLBY REST AREA WB 3-2511	1288	MCLOUTH, CITY OF
1117	KDOT-GOODLAND RST AREA EB 3-2516	1287	MCPHERSON CO RWD 1
1118	KDOT-GOODLAND RST AREA WB 3-2515	1054	MCPHERSON, CITY OF
1199	KDOT-INGALLS REST AREA 6-3502	1783	MEADE STATE PARK WATER SUPPLY 1
1764	KDOT-NORTON RESVR RST AR 3-1515	1802	MEADE STATE PARK WATER SUPPLY 2
1618	KDOT-SEWARD CO WEIGH STA 6-4030	1323	MEADE, CITY OF
1595	KDOT-WAKEENEY RST AR EB 3-3512	1251	MEADOW ACRES MOBILE HOME COURT

Kansas Public Water Supplies

PWS No.	PWS System	PWS No.	PWS System
1490	KDOT-WAKEENEY RST AREA WB 3-3511	1091	MEDICINE LODGE, CITY OF
1792	KDWP MILFORD FISH HATCHERY	1535	MELVERN, CITY OF
1633	KDWP OPERATIONS MAINTENANCE SECT	1700	MIAMI CO RWD 2
1080	KENSINGTON, CITY OF	1386	MID-CONTINENT INDUSTRIAL PARK
1663	KINGMAN, CITY OF	1520	MIDWAY USA TRUCKSTOP/WES-KAN OIL
1578	KINGSTON MOBILE HOME PARK	1683	MILFORD, CITY OF
1144	KINSLEY, CITY OF	1468	MILLER MOBILE HOME PARK
1482	KIOWA KITCHEN	1044	MILTONVALE, CITY OF
1257	KIOWA, CITY OF	1171	MINNEAPOLIS, CITY OF
1085	KIRWIN, CITY OF	1094	MINNEOLA, CITY OF
1276	KISMET, CITY OF	1684	MITCHELL CO RWD 2
1563	KN PROCESSING INC	1495	MOLINE, CITY OF
1470	KONZA VALLEY WATER BENEFIT DISTR	1518	MONTEZUMA MENNONITE SCHOOL
1780	KPL WESTERN RESOURCES G EVANS ST	1210	MONTEZUMA, CITY OF
1640	KPL-JEFFREY ENERGY CENTER	1596	MONUMENT GRADE SCHOOL USD 274
1408	KSU AGRICULTURAL RESEARCH CENTER	1159	MORGANVILLE, CITY OF
1529	LACROSSE, CITY OF	1366	MORLAND, CITY OF
1727	LACYGNE, CITY OF	1785	MORNING STAR RANCH
1636	LAKESIDE UNITED METHODIST CENTER	1643	MORRIS CO RWD 1
1622	LAKESIDE VILLAGE IMPROVEMENT DIST	1265	MOSCOW, CITY OF
1296	LAKIN, CITY OF	1718	MOUND CITY, CITY OF
1449	LANE CO RWD 1	1179	MOUNDRIDGE, CITY OF
1025	LANE, CITY OF	1003	MOUNT HOPE, CITY OF
1027	LANSING CORRECTIONAL FACILITY	1077	MULBERRY, CITY OF
1477	LARNED STATE HOSPITAL	1269	MULLINVILLE, CITY OF
1196	LARNED, CITY OF	1536	MULVANE MOBILE HOME COURT
1624	LAWRENCE, CITY OF	1534	MUSCOTAHA, CITY OF
1806	LE ROY, CITY OF	1634	NATIONAL BEEF PACKING, LP-DODGE
1019	LEAVENWORTH CO RWD 9	1436	NATIONWIDE ESTATES MHP
1230	LEAVENWORTH WATER DEPARTMENT	1128	NATOMA, CITY OF
1371	LEBANON, CITY OF	1343	NEMAHA CO RWD 1
1325	LECOMPTON, CITY OF	1344	NEMAHA CO RWD 3
1110	LEHIGH, CITY OF	1024	NEMAHA CO RWD 4
1406	LENORA, CITY OF	1728	NEODESHA, CITY OF
1002	LEON, CITY OF	1114	NESS CITY, CITY OF
1183	LEONARDVILLE, CITY OF	1053	NEWTON, CITY OF
1317	LEOTI, CITY OF	1249	NGPL - HEIZER
1145	LEWIS, CITY OF	1062	NICKERSON, CITY OF
1800	LIBERAL FEEDERS, LP MHP	1653	NICODEMUS TWP(VILLA HOUSING PWS)
1272	LIBERAL, CITY OF	1487	NORCATUR, CITY OF
1407	LIEBENTHAL, CITY OF	1610	NORTHERN NATURAL GAS-BUSHTON
1139	LINCOLN, CITY OF	1204	NORTHERN NATURAL GAS-MULLINVILLE
1156	LINDSBORG, CITY OF	1593	NORTHERN SUN/ADM
1760	LINN VALLEY LAKES POA	1667	NORTHSTAR MOBILE HOME PARK
1163	LINN, CITY OF	1458	NORTON CO RWD 1
1591	LINWOOD, CITY OF	1424	NORTON CORRECTIONAL FACILITY
1059	LITTLE RIVER, CITY OF	1421	NORTON, CITY OF
1337	LIVING WATER RANCH	1039	NORTONVILLE, CITY OF
1079	LOGAN, CITY OF	1191	NORWICH, CITY OF
1489	LONG ISLAND, CITY OF	1247	OAKLEY, CITY OF
1047	LONGFORD, CITY OF	1382	OBERLIN, CITY OF
1793	LONGHORN STEAKHOUSE and SALOON	1507	OCONNELL YOUTH RANCH
1732	LONGTON, CITY OF	1143	OFFERLE, CITY OF
1058	LORRAINE, CITY OF	1286	OGDEN, CITY OF
1512	OKETO, CITY OF	1702	RICHMOND, CITY OF
1150	OLATHE, CITY OF	1211	RICKS RESTAURANT
1459	OLMITZ, CITY OF	1170	RILEY, CITY OF
1766	OLSBURG, CITY OF	1784	RIVERCHASE MOBILE HOME PARK
1067	ONAGA, CITY OF	1346	RIVERTON USD 404
1465	ONEIDA, CITY OF	1472	ROBINSON OIL CO CITGO 15
1694	OSAGE CITY, CITY OF	1035	ROBINSON, CITY OF
1463	OSAGE CO RWD 2	1685	ROCK SPRINGS 4-H CENTER
1690	OSAGE CO RWD 3	1506	ROCKY FORD MOBILE HOME COURT
1339	OSAGE CO RWD 4	1478	ROLLA, CITY OF
1461	OSAGE CO RWD 5	1215	ROLLING HILLS LANDOWNERS ASSN
1706	OSAWATOMIE, CITY OF	1503	ROLLING MEADOWS MOBILE HOME CT

Kansas Public Water Supplies

PWS No.	PWS System	PWS No.	PWS System
1364	OSBORNE CO RWD 1A	1453	ROOKS CO RWD 1
1127	OSBORNE, CITY OF	1454	ROOKS CO RWD 2
1723	OSWEGO, CITY OF	1457	ROOKS CO RWD 3
1142	OTIS, CITY OF	1641	ROSSVILLE, CITY OF
1181	OTTAWA CO RWD 1	1260	ROZEL, CITY OF
1642	OTTAWA CO RWD 2	1124	RUSH CENTER, CITY OF
1688	OTTAWA, CITY OF	1372	RUSH CO RWD 1
1021	OVERBROOK, CITY OF	1456	RUSSELL CO RWD 1
1384	OXFORD, CITY OF	1455	RUSSELL CO RWD 2
1541	OZAWKIE, CITY OF	1252	RUSSELL CO RWD 4
1379	PALCO, CITY OF	1532	RUSSELL, CITY OF
1757	PALETERIA LA TROPICANA	1693	SABETHA, CITY OF
1399	PALMER, CITY OF	1571	SALINA, CITY OF
1703	PAOLA, CITY OF	1645	SALINE CO RWD 2
1036	PARADISE PARK MOBILE HOME COURT	1154	SALINE CO RWD 4
1320	PARK CITY, CITY OF	1184	SALINE CO RWD 6
1615	PARK HILLS COUNTRY CLUB	1614	SALINE CO RWD 8
1412	PARK, CITY OF	1617	SANTA FE TRAIL CENTER
1739	PARKER, CITY OF	1598	SAPPA VALLEY YOUTH RANCH
1740	PARSONS, CITY OF	1416	SATANTA, CITY OF
1499	PARTRIDGE GRADE SCHOOL-USD 312	1263	SAWYER, CITY OF
1609	PATES CONVENIENCE CORNER	1348	SCAMMON, CITY OF
1560	PAWNEE ROCK, CITY OF	1081	SCANDIA, CITY OF
1022	PAXICO, CITY OF	1132	SCHOENCHEN, CITY OF
1531	PAXTON SUBDIVISION	1198	SCOTT CITY, CITY OF
1699	PERRY RES LONGVIEW WATER SUPPLY	1726	SEDAN, CITY OF
1029	PERRY, CITY OF	1391	SEDGWICK CO RWD 4
1388	PHEASANT ACRES COUNTRY LIVING	1370	SELDEN, CITY OF
1244	PHILLIPSBURG, CITY OF	1292	SENECA, CITY OF
1551	PIERCEVILLE-PLYMELL SCHL USD 457	1731	SEVERY, CITY OF
1006	PILGRIM CHRISTIAN SCHOOL	1545	SHALLOW WATER SCHOOL-USD 466
1075	PITTSBURG, CITY OF	1123	SHARON SPRINGS, CITY OF
1298	PLAINS, CITY OF	1098	SHARON, CITY OF
1137	PLAINVILLE, CITY OF	1232	SHAWNEE CO RWD 2C (10and11)
1720	PLEASANTON, CITY OF	1229	SHAWNEE CO RWD 4
1775	PLEASURES	1651	SHEPHERDS GATE BOYS HM @LK WASSY
1462	POMONA, CITY OF	1334	SILVER LAKE, CITY OF
1471	PONDEROSA MOBILE HOME COURT	1572	SIMMONS SUBDIVISION
1432	PORTIS, CITY OF	1397	SIMPSON, CITY OF
1599	POSSIES PLACE	1264	SKYLINE SCHOOL-USD 438
1511	POTTAWATOMIE CO RWD 1	1486	SMITH CENTER, CITY OF
1761	POTTAWATOMIE CO RWD 2	1131	SMITH CO RWD 1
1226	POTTAWATOMIE CO RWD 3	1057	SOLOMON, CITY OF
1533	PRAIRIE DOG STATE PARK	1014	SOUTH HAVEN, CITY OF
1658	PRAIRIE DUNES COUNTRY CLUB	1389	SOUTH HUTCHINSON, CITY OF
1385	PRAIRIE SCHOONER MOBILE HOME CT	1479	SOUTHWESTERN HEIGHTS HS-USD 483
1488	PRAIRIE VIEW, CITY OF	1311	SOUTHWIND SUBDIVISION
1414	PRATT AIRPORT	1473	SPARE TYME LLC SPARE TYME BOWL
1312	PRATT, CITY OF	1274	SPEARVILLE, CITY OF
1579	PRESTO OIL 15	1431	SPEED, CITY OF
1266	PRESTON, CITY OF	1698	SPRING HILL, CITY OF
1500	PRETTY PRAIRIE, CITY OF	1673	SPRING LAKE RESORT @ HALSTEAD
1093	PROTECTION, CITY OF	1119	ST FRANCIS, CITY OF
1701	PUBLIC WHOLESALE WSD 12	1235	ST GEORGE, CITY OF
1725	PUBLIC WHOLESALE WSD 4	1147	ST JOHN, CITY OF
1717	PUBLIC WHOLESALE WSD 5	1501	ST JOSEPH ELEM SCHOOL - USD 267
1011	PUBLIC WHOLESALE WSD 17	1289	ST MARYS, CITY OF
1254	QUINSTAR CORPORATION	1750	ST PAUL, CITY OF
1130	QUINTER, CITY OF	1767	ST PAULS LUTHERAN SCHOOL
1329	QUIVIRA SCOUT RANCH	1221	ST PETERS SCHOOL
1600	RANDYS CLUB	1297	STAFFORD, CITY OF
1437	RANSOM, CITY OF	1781	STAGG HILL GOLF CLUB, INC.
1291	RANTOUL, CITY OF	1061	STERLING, CITY OF
1418	RAYMOND, CITY OF	1116	STOCKTON, CITY OF
1307	REDROCK SCHOOL USD 214	1151	STRONG CITY, CITY OF
1505	RENO CO RWD 1	1280	STROTHER FIELD AIRPORT IND PARK

Kansas Public Water Supplies

PWS No.	PWS System	PWS No.	PWS System
1387	RENO CO RWD 101	1576	WESTERN ACRES MOBILE HOME COURT
1753	RENO CO RWD 3	1306	WESTERN PLAINS CHRISTIAN SCHOOL
1675	RENO CO WATER DISTRICT 8	1631	WESTMORELAND, CITY OF
1178	REPUBLIC CO RWD 1	1548	WESTSIDE MOBILE HOME PARK
1157	REPUBLIC CO RWD 2	1068	WETMORE, CITY OF
1172	REPUBLIC, CITY OF	1557	WHATLEYS TRAILER PARK
1133	REXFORD, CITY OF	1213	WHEATLAND CAFE
1567	SUNFLOWER VILLAGE MHP	1484	WHEATLAND HIGH SCHOOL-USD 292
1219	SUNNY ACRES MOBILE HOME COURT	1577	WHEATSTATE CAMP
1203	SUNNY PLAINS SCHOOL	1152	WHITE CITY, CITY OF
1772	SUPPESVILLE COASTAL	1590	WHITE CLOUD, CITY OF
1799	SUPPESVILLE GOLF COURSE RESTAURANT	1189	WHITEHURST TRAILER PARK
1796	SUPREME FEEDERS MHP	1069	WHITING, CITY OF
1544	SW KS RESEARCH EXTENSION CNTR	1052	WICHITA, CITY OF
1237	SYCAMORE SPRINGS CAMPGROUND	1238	WILDCAT CAFE
1661	SYLS RESTAURANT	1521	WILROADS GARDEN SCHOOL-USD 443
1648	SYLVAN GROVE, CITY OF	1527	WILSON LAKE ESTATES
1102	SYLVIA, CITY OF	1177	WILSON, CITY OF
1324	SYRACUSE, CITY OF	1032	WINCHESTER, CITY OF
1798	TAMMYS PLACE	1635	WINDSONG PLACE
1046	TESCOTT, CITY OF	1711	WINFIELD, CITY OF
1745	THAYER, CITY OF	1526	WINONA, CITY OF
1656	THE HARBOR	1601	WONDRFL AMERICAN CHINESE RESTRNT
1668	THE KINGS CAMP	1744	WOODSON CO RWD 1
1650	THUNDERBIRD MARINA	1433	WOODSTON, CITY OF
1589	TIMBER CREEK EAST WATER DISTRICT	1714	YATES CENTER, CITY OF
1410	TIMKEN, CITY OF	1581	STUART JOHNSON RENTALS
1613	TIPTON, CITY OF	1028	STUCKEYS DQ 192-GRINNELL
1621	TONGANOXIE, CITY OF	1652	STUCKEYS PECAN SHOPPE
1686	TOPEKA, CITY OF	1439	SUBLETTE, CITY OF
1722	TORONTO, CITY OF	1224	SUBURBAN WATER COMPANY
1580	TOWNS RIVERVIEW SUBDIVISION	1231	SUMMERFIELD, CITY OF
1586	TREGO CO RWD 1	1646	SUNDOWNER WEST MOBILE HOME PARK
1773	TREGO CO RWD 2	1786	YMCA CAMP HYDE INC
1321	TRIBUNE, CITY OF	1797	YODER MEATS
1342	TROY, CITY OF	1096	ZENDA, CITY OF
1148	TURON, CITY OF		
1514	TUTTLE TERRACE TRAILER COURT		
1005	UDALL, CITY OF		
1638	ULYSSES, CITY OF		
1240	UNIVERSITY PARK WATER DISTRICT		
1419	USD 306 SOUTHEAST SALINE		
1434	UTICA, CITY OF		
1691	VALLEY FALLS, CITY OF		
1508	VERMILLION, CITY OF		
1605	VFW POST 8773		
1122	VICTORIA, CITY OF		
1538	VULCAN MATERIALS		
1626	WABAUNSEE CO RWD 2		
1561	WAKEENEY, CITY OF		
1403	WAKEFIELD, CITY OF		
1425	WALLACE CO RWD 1		
1788	WALLACE, CITY OF		
1628	WALNUT GROVE MHC BRENSING-WHITE		
1630	WALNUT GROVE MHC BROOKS		
1602	WALTHERS OIL/15-36 TRUCKSTOP		
1322	WAMEGO, CITY OF		
1161	WASHINGTON CO RWD 1		
1162	WASHINGTON CO RWD 2		
1082	WASHINGTON, CITY OF		
1619	WATER DISTRICT 1 OF JOHNSON CO		
1071	WATERVILLE, CITY OF		
1671	WEDGEWOOD PUBLIC GOLF COURSE		
1353	WEIR, CITY OF		
1319	WELLINGTON, CITY OF		
1669	WEST HILLS SUBDIVISION		

APPENDIX B

CONTAMINANT LIST

NON-POINT CONTAMINANTS

Non-Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
1400	Mining Industry	Sedimentation	B2	Erosion and Sediment Control	KAR 28-16, Office of Surface Mining
1429	Rock Quarry	Sedimentation	B2	Erosion and Sediment Control	KAR 28-16
1521	Single-family Housing	Oil, Paint, Pesticides, Fertilizers	A B* B1 B2 C*	Proper cleaning and disposal of household hazardous waste. Proper storage, application, and clean up of pesticides and fertilizers	KAR 28-48, KDHE, KDEM
1542	Non residential construction	Sedimentation	B2	Erosion and Sediment Control	KAR 28-16, KDHE
1611	Highway and Street Construction	Sedimentation	B2	Erosion and Sediment Control	KAR 28-16, KDHE
1622	Bridge Construction	Sedimentation	B2	Erosion and Sediment Control	KAR 28-16, KDHE
1692	Electric power plant construction	Sedimentation	B2	Erosion and Sediment Control	KAR 28-16 KDHE
7992	Golf Course	Fertilizers and pesticides	A B* B1 B2 C*	Proper application of fertilizers and pesticides. Proper cleaning of equipment and disposal of chemicals.	KDHE KAR 28-16
8421	Botanical Gardens	Fertilizers and pesticides	A B* B1 B2 C*	Proper application of fertilizers and pesticides. Proper cleaning of equipment and disposal of chemicals.	KDHE KAR 28-16
111	Wheat field	Fertilizers and pesticides Sedimentation	A B* B1 B2 C*	Proper application of fertilizers and pesticides. Proper cleaning of equipment and disposal of chemicals.	KDHE KAR 28-16 KDA
115	Corn field	Fertilizers and pesticides Erosion and Sedimentation	A B* B1 B2 C*	Proper application of fertilizers and pesticides. Proper cleaning of equipment and disposal of chemicals. Practice proper agriculture erosion and sediment controls	KDHE KAR 28-16 KDA
116	Soybeans	Fertilizers and pesticides Erosion and Sedimentation	A B* B1 B2 C*	Proper application of fertilizers and pesticides. Proper cleaning of equipment and disposal of chemicals. Practice proper agriculture erosion and sediment controls	KDHE KAR 28-16 KDA
211	Cattle farm	Fertilizers and pesticides Erosion and sedimentation	A B* B1 B2 C*	Proper application of fertilizers and pesticides. Proper cleaning of equipment and disposal of chemicals. Maintain riparian areas along waterways and keep cattle out of these areas	KDHE KAR 28-16 KDA
AE	Dog race track	Erosion and sedimentation	B2	Proper erosion and sediment control	KDHE KAR 28-16
AJ	Horse race track	Erosion and sedimentation	B2	Proper erosion and sediment control	KDHE KAR 28-16

Non-Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
AX	Urbanized area	Oil, Paint, Pesticides, Fertilizers	A B* B1 B2 C*	Proper cleaning and disposal of household hazardous waste. Proper storage, application, and clean up of pesticides and fertilizers	KAR 28-48 KDHE KDEM
BC	CRP grassland	Erosion and sedimentation	B2	Proper erosion and sediment control	KDHE KAR 28-16
BD	Fair grounds	Erosion and sedimentation	B2	Proper erosion and sediment control	KDHE KAR 28-16
BF	Gravel Road	Erosion and sedimentation	B2	Proper erosion and sediment control	KDHE KAR 28-16
BG	Gravel Pit	Erosion and sedimentation	B2	Proper erosion and sediment control	KDHE KAR 28-16
BH	Grazing Livestock	Erosion and sedimentation		Proper application of fertilizers and pesticides. Proper cleaning of equipment and disposal of chemicals. Maintain riparian areas along waterways and keep cattle out of these areas	
BM	Milo field	Fertilizers and Pesticides Erosion and sedimentation	A B* B1 B2 C*	Proper application of fertilizers and pesticides. Proper cleaning of equipment and disposal of chemicals.	KDHE KAR 28-16 KDA
BN	Native grass (non-CRP)	Erosion and sedimentation	B2	Proper erosion and sediment control	KDHE KAR 28-16
BO	Nature Center	Erosion and sedimentation	B2	Proper erosion and sediment control	KDHE KAR 28-16
BU	Riparian land	Erosion and sedimentation	B2	Proper erosion and sediment control	KDHE KAR 28-16
BZ	Wetland	Erosion and sedimentation	B2	Proper erosion and sediment control	KDHE KAR 28-16
CA	Zoo	Fertilizers and Pesticides Erosion and sedimentation	A B* B1 B2 C*	Proper application of fertilizers and pesticides. Proper cleaning of equipment and disposal of chemicals. Proper erosion and sediment control	KDHE KAR 28-16 KDA
D	Sorghum	Fertilizers and Pesticides Erosion and sedimentation	A B* B1 B2 C*	Proper application of fertilizers and pesticides. Proper cleaning of equipment and disposal of chemicals.	KDHE KAR 28-16

Non-Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
					KDA
E	Alfalfa field	Fertilizers and Pesticides Erosion and sedimentation	A B* B1 B2 C*	Proper application of fertilizers and pesticides. Proper cleaning of equipment and disposal of chemicals.	KDHE KAR 28-16 KDA
F	Range and Pasture	Erosion and sedimentation	B2	Proper erosion and sediment control	KDHE KAR 28-16
T	Lawn & Turf	Fertilizers and Pesticides Erosion and sedimentation	A B* B1 B2 C*	Proper application of fertilizers and pesticides. Proper cleaning of equipment and disposal of chemicals. Proper erosion and sediment control	KDHE KAR 28-16 KDA
X	Sunflower field	Fertilizers and Pesticides Erosion and sedimentation	A B* B1 B2 C*	Proper application of fertilizers and pesticides. Proper cleaning of equipment and disposal of chemicals. Proper erosion and sediment control	KDHE KAR 28-16 KDA

POINT CONTAMINANTS

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
1000	Metal mining	Metal slag, TSS	B	Erosion control and runoff retention	KAR 47-1 Mined Land Conservation Reclamation 40 CFR 440
1381	Drilling Oil and Gas	Oil	C	Drill water retention and treatment	KAR 28-41, 45
		Salt Water	B		40 CFR 435
1389	Oil or Gas Well	Oil	C	Proper management of production wastes	KAR 28-41, 45
	Oil and Gas Field Services	Salt Water	B		40 CFR 435
1795	Wrecking and Demolition work Construction demolition landfill	TSS, could contain metals	B1 B2	Erosion control and proper waste management Proper cover and runoff containment for the fill area	40CFR Part 122 Storm Water Construction Permitting and KDHE Storm Water Pollution Prevention Rules 40 CFR 445 and Solid Waste Permitting rules, Storm Water Permitting rules
2011	Meat packing plant	BOD, pathogens Oil and grease	A B*	Wastewater pretreatment and/or discharge to a POTW	40CFR 432 and State or federal Storm water pollution prevention regulations
2013	Sausages and prepared meat packaging	BOD, pathogens Oil and grease	A B*	Wastewater pretreatment and/or discharge to a POTW	40 CFR 432 and State or federal Storm water pollution prevention regulations
2023	Condensed milk manufacture	BOD Oil and grease	A	Wastewater pretreatment and/or discharge to a POTW	40 CFR 405 and State or federal Storm water pollution prevention regulations
2024	Ice-cream Manufacture	BOD oil and grease	A	Wastewater pretreatment and/or discharge to a POTW	40 CFR 405 State or federal Storm water pollution prevention regulations
2026	Dairy products manufacture	BOD Oil and grease	A	Wastewater pretreatment and/or discharge to a POTW	40 CFR 405 and State or federal Storm water pollution prevention regulations
2038	Frozen specialties manufacturing	BOD	A	Wastewater pretreatment and/or discharge to a POTW	40 CFR 122 and State or federal Storm water pollution prevention regulations
2041	Flour Mill and Food Grains	BOD	A	Wastewater pretreatment and/or discharge to a POTW	40 CFR 122 and

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
		TSS	B		State or federal Storm water pollution prevention regulations
2046	Wet corn milling	BOD	A	Wastewater pretreatment and/or discharge to a POTW	40 CFR 406 and
		TSS	B		State or federal Storm water pollution prevention regulations
2047	Pet food manufacture	BOD, oil and grease	A	Wastewater pretreatment and/or discharge to a POTW	40 CFR 122 and
		TSS	B		State or federal Storm water pollution prevention regulations
2048	Prepared foods manufacture	BOD, oil and grease	A	Wastewater pretreatment and/or discharge to a POTW	40 CFR 407 and
		TSS	B		State or federal Storm water pollution prevention regulations
2052	Bakery products manufacture	BOD, oil and grease	A	Wastewater pretreatment and/or discharge to a POTW. Grounds maintenance and cleanup.	40 CFR 122 and
		TSS	B		State or federal Storm water pollution prevention regulations
2075	Soybean oil mills	BOD, oil and grease	A	Wastewater pretreatment and/or discharge to a POTW. Grounds maintenance and cleanup.	40 CFR 406 and
		TSS	B		State or federal Storm water pollution prevention regulations
2076	Vegetable oil mills	BOD, oil and grease	A	Wastewater pretreatment and/or discharge to a POTW. Grounds maintenance and cleanup.	40 CFR 122 and
		TSS	B		State or federal Storm water pollution prevention regulations
2077	Animal and Marine Fat Oil Manufacture	BOD, oil and grease	A	Wastewater pretreatment and/or discharge to a POTW. Grounds maintenance and cleanup. Fat traps on sewer lines.	40 CFR 122 and
		TSS	B		State or federal Storm water pollution prevention regulations
2086	Bottled and Canned Soft Drinks Manufacture	BOD	A	Wastewater pretreatment and/or discharge to a POTW.	40 CFR 407 and
					State or federal Storm water pollution prevention regulations
2231	Weaving, finishing mills wool manufacture	Bleach, dyes,	B	Wastewater pretreatment and/or discharge to a POTW.	40 CFR 410 and
					State or federal Storm water pollution prevention regulations
2261	Finishing plants, cotton	Bleach, dyes,	B	Wastewater pretreatment and/or discharge to a POTW.	40 CFR 410 and
					State or federal Storm water pollution prevention regulations
2411	Logging camps	Domestic wastes	A	Erosion control measures for logged areas and treatment of sanitary wastes	KAR-28-5 and
		TSS	B		State or federal Storm water pollution prevention regulations

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
2426	Hardwood dimension flooring manufacture	TSS	B	Discharge of process waters to POTW. Minimize outdoor storage.	State or federal Storm water pollution prevention regulations
		VOCs	D		
2434	Wood kitchen cabinets Manufacture	TSS	B	Discharge of process waters to POTW. Minimize outdoor storage.	State or federal Storm water pollution prevention regulations
		VOCs	D		
2439	Structural wood members manufacturing	TSS	B	Discharge of process waters to POTW. Minimize outdoor storage.	State or federal Storm water pollution prevention regulations
		VOCs	D		
2448	Wood Pallets and Skids Manufacture	TSS	B	Discharge of process waters to POTW. Minimize outdoor storage.	State or federal Storm water pollution prevention regulations
		VOCs	D		
2449	Wood containers manufacture	TSS	B	Discharge of process waters to POTW. Minimize outdoor storage.	State or federal Storm water pollution prevention regulations
		VOCs	D		
2451	Mobil home manufacture	TSS	B	Discharge of process waters to POTW. Minimize outdoor storage.	State or federal Storm water pollution prevention regulations
		VOCs	D		
2452	Prefabricated wood buildings manufacture	TSS	B	Discharge of process waters to POTW. Minimize outdoor storage.	State or federal Storm water pollution prevention regulations
		VOCs	D		
2491	Wood Preserving and Treating		D	Contain and treat all water in contact with process or treated wood. Minimize outdoor storage.	State or federal Storm water pollution prevention regulations
			C		
2511	Wood household furniture manufacture	TSS	B	Discharge of process waters to POTW. Minimize outdoor storage.	State or federal Storm water pollution prevention regulations
		VOCs	D		
2512	Upholstered household furniture manufacture	TSS	B	Discharge of process waters to POTW.	State or federal Storm water pollution prevention regulations
2514	Metal household furniture manufacture	VOCs	D	Discharge of process waters to POTW.	State or federal Storm water pollution prevention regulations
2515	Mattress and Bedsprings Manufacture	VOCs	D	Discharge of process waters to POTW.	State or federal Storm water pollution prevention regulations
2517	Wood TV and Radio Cabinets Manufacture	TSS	B	Discharge of process waters to POTW.	State or federal Storm water pollution prevention regulations
		VOCs	D		
2519	Household furniture manufacture	TSS	B	Discharge of process waters to POTW.	State or federal Storm water pollution prevention regulations
		VOCs	D		
2521	Wood office furniture Manufacture	TSS	B	Discharge of process waters to POTW.	State or federal Storm water pollution prevention regulations
		VOCs	D		
2522	Metal office furniture	VOCs	D	Discharge of process waters to POTW.	State or federal Storm water pollution prevention regulations

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
2531	Public Building and Related Furniture Manufacture	TSS	B	Discharge of process waters to POTW.	State or federal Storm water pollution prevention regulations
		VOCs	D		
2541	Wood Partitions and Fixtures Manufacture	TSS	B	Discharge of process waters to POTW.	State or federal Storm water pollution prevention regulations
		VOCs	D		
2542	Metal Partitions and Fixtures Manufacture	VOCs	D	Discharge of process waters to POTW.	State or federal Storm water pollution prevention regulations
2591	Drapery, hardware, blinds and shades	VOCs	D	Discharge of process waters to POTW.	State or federal Storm water pollution prevention regulations
2599	Furniture and Fixtures Manufacture	TSS	B	Discharge of process waters to POTW.	State or federal Storm water pollution prevention regulations
		VOCs	D		
2653	Corrugated and solid fiber boxes Manufacture	BOD	A	Discharge of process waters to POTW. Minimize outdoor storage.	40 CFR 430 and
		TSS	B		State or federal Storm water pollution prevention regulations
2754	Commercial Printing and Gravure	VOCs	D	Recycle chemical wastes where possible.	40 CFR 459 and
					State or federal Storm water pollution prevention regulations
2812	Chemicals Alkalies and chlorine Manufacture	Alkalies and chlorine	D	Recycle chemical wastes where possible.	40 CFR 414 and
					State or federal Storm water pollution prevention regulations
2813	Industrial gases		D	NA	State or federal Storm water pollution prevention regulations
2816	Inorganic pigments manufacture	Metals and other inorganic matter	B	Recycle chemical wastes where possible.	40 CFR 446 and
					State or federal Storm water pollution prevention regulations
2819	Industrial inorganic chemicals manufacture	metals	B	Recycle chemical wastes where possible.	40 CFR 415 and
		solvents	D		State or federal Storm water pollution prevention regulations
2821	Plastics Materials and Resins Manufacture	Solvents, plasticizers, VOCs	D	Discharge process water to POTW	40 CFR 424 and
					State or federal Storm water pollution prevention regulations
2834	Pharmaceutical preparations	VOCs	D	Discharge process water to POTW	40 CFR 439 and
		Biological matter	A		State or federal Storm water pollution prevention regulations
2841	Soap and other Detergents Manufacture	Phosphates, nitrates surfactants	B, B1	Discharge process water to POTW	40 CFR 417 and
					State or federal Storm water pollution prevention regulations

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
2842	Polishes and Sanitation Goods Manufacture	VOCs	D B, B1	Discharge process water to POTW	State or federal Storm water pollution prevention regulations
2851	Paints and Allied Products Manufacture	Solvents and other VOCs metals	D B	Discharge process water to POTW. Recycle where possible and manage solid waste properly	40 CFR 446 and State or federal Storm water pollution prevention regulations
2860	Organic chemical manufacturing	VOCs inorganics	D B	Discharge process water to POTW	40 CFR 414 and State or federal Storm water pollution prevention regulations
2869	Industrial inorganic chemicals manufacture	Metals and other inorganics	B	Discharge process water to POTW	40 CFR 415 and State or federal Storm water pollution prevention regulations
2873	Nitrogen fertilizer production	nitrogen	B, B*	Minimize contact of product with water. Contain and treat process wastewater	40 CFR 418 and State or federal Storm water pollution prevention regulations
2875	Fertilizers, Mixing and Manufacture Fertilizer storage	Nitrogen, phosphorous	B, B*	Minimize contact of product with water. Contain and treat process wastewater Protect product from contact with water.	40 CFR 418 and State or federal Storm water pollution prevention regulations
2879	Pesticides and Ag Chemicals Manufacture	Semi volatiles and pesticides Inorganics, etc	C, C* B, B1, B2, B*	Minimize contact of products with water. Contain and treat process wastewater. Minimize any outdoor storage	40 CFR 455 and State or federal Storm water pollution prevention regulations
2891	Adhesives and Sealants Manufacture	VOCs	D	Minimize contact of products with water. Contain and treat process wastewater.	40 CFR 415 and State or federal Storm water pollution prevention regulations
2892	Explosives manufacture	VOCs Nitrates, phosphorous, inorganics	D B, B1, B*	Contain and treat all process water in impervious treatment vessels.	40 CFR 457 and State or federal Storm water pollution prevention regulations
2893	Printing ink manufacture	VOCs	D	Recycle where possible. Manage wastes properly, and discharge to a POTW	40 CFR 447 and State or federal Storm water pollution prevention regulations
2895	Carbon black manufacture	carbon	B	Discharge process water to a POTW	40 CFR 458 and State or federal Storm water pollution prevention regulations

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
2899	Chemical preparations manufacturing	VOCs inorganics	D B	Collect and pre-treat prior to discharge to a POTW	40 CFR 415 or 414 and State or federal Storm water pollution prevention regulations
2911	Petroleum refining	inorganics VOCs	B D	Collect and pre-treat wastewater. Control storm water runoff. Minimize ground contamination with petroleum or other products	40 CFR 419 and State or federal Storm water pollution prevention regulations
2951	Asphalt pavement production Paving Mixtures and blocks manufacturing	inorganics VOCs	D B	Collect and pre-treat wastewater. Control storm water runoff. Minimize ground contamination with petroleum or other products Control storm water runoff to minimize TSS transport	40 CFR 443 and State or federal Storm water pollution prevention regulations
2952	Asphalt Felts and Coatings Manufacture	inorganics VOCs	B D	Control storm water runoff to minimize contact with product or wastes. Pre-treat wastewater prior to discharge (direct or POTW)	40 CFR 443 and State or federal Storm water pollution prevention regulations
2992	Lubricating Oils and Grease Manufacture	Semi volatiles VOCs	C D	Control storm water runoff to minimize contact with product or wastes. Pre-treat wastewater prior to discharge (direct or POTW)	State or federal Storm water pollution prevention regulations
2999	Petroleum and Coal Products Manufacturing	inorganics VOCs	B D	Control storm water runoff to minimize contact with product or wastes. Pre-treat wastewater prior to discharge (direct or POTW)	State or federal Storm water pollution prevention regulations
3011	Tires and Inner Tubes Manufacture	Inorganics, metals VOCs	B D	Pre-treat wastewater prior to discharge. Minimize outdoor storage and control storm water runoff.	40 CFR 428 and State or federal Storm water pollution prevention regulations
3052	Rubber and Plastic Hose and belting Manufacture	Inorganics, metals VOCs	B D	Pre-treat wastewater prior to discharge. Minimize outdoor storage and control storm water runoff.	40 CFR 428 and State or federal Storm water pollution prevention regulations
3053	Gaskets, packing and sealing devices Manufacture	Inorganics, metals VOCs	B D	Pre-treat wastewater prior to discharge. Minimize outdoor storage and control storm water runoff.	State or federal Storm water pollution prevention regulations
3087	Custom compound purchased resins manufacturing	inorganics VOCs	B D	Pre-treat wastewater prior to discharge. Minimize outdoor storage and control storm water runoff. Recycle where possible	40 CFR 463 and State or federal Storm water pollution prevention regulations
3088	Plastics plumbing fixtures Manufacture	inorganics VOCs	B D	Pre-treat wastewater prior to discharge. Minimize outdoor storage and control storm water runoff.	40 CFR 463 and State or federal Storm water pollution prevention regulations
3089	Plastic products manufacturing	inorganics	B	Pre-treat wastewater prior to discharge. Minimize outdoor storage and control storm water runoff.	40 CFR 463 and

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
		VOCs	D		State or federal Storm water pollution prevention regulations
3241	Cement, hydraulic manufacturing	Minerals and TSS	B	Minimize outdoor storage and control storm water runoff.	40 CFR 411 and State or federal Storm water pollution prevention regulations
3251	Brick and structural clay tile Manufacture	Minerals and TSS	B	Minimize outdoor storage and control storm water runoff.	State or federal Storm water pollution prevention regulations
3272	Concrete products Manufacture	Minerals and TSS	B	Minimize outdoor storage and control storm water runoff.	State or federal Storm water pollution prevention regulations
3272	Redi-mix concrete plant	Minerals and TSS	B	Minimize outdoor storage and control storm water runoff.	State or federal Storm water pollution prevention regulations
3296	Mineral wool manufacturing	Metals, minerals and TSS	B	Minimize outdoor storage and control storm water runoff. Pre-treat process wastewater prior to discharge to POTW	40 CFR 436 and State or federal Storm water pollution prevention regulations
3299	Non-metallic mineral products manufacturing	Minerals and TSS	B	Minimize outdoor storage and control storm water runoff.	40 CFR 436 and State or federal Storm water pollution prevention regulations
3312	Blast furnaces and steel mills manufacturing	Minerals, metals, TSS	B	Minimize outdoor storage and control storm water runoff. Pre-treat process wastewater prior to discharge to POTW or direct	40 CFR 420 and State or federal Storm water pollution prevention regulations
2217	Steel pipe and tubes Manufacture	Inorganics, metals VOCs	B D	Minimize outdoor storage and control storm water runoff. Pre-treat process wastewater prior to discharge to POTW	40 CFR 464 and State or federal Storm water pollution prevention regulations
3321	Gray iron foundry	Minerals, metals, and TSS	B	Minimize outdoor storage and control storm water runoff. Pre-treat process wastewater prior to discharge to POTW	40 CFR 420 and State or federal Storm water pollution prevention regulations
3325	Steel foundry	Minerals, metals and TSS	B	Minimize outdoor storage and control storm water runoff. Pre-treat process wastewater prior to discharge to POTW	40 CFR 420 and State or federal Storm water pollution prevention regulations
3340	Secondary non-ferrous metals manufacture	Minerals, metals and TSS	B	Minimize outdoor storage and control storm water runoff. Pre-treat process wastewater prior to discharge to POTW	40 CFR 471 and State or federal Storm water pollution prevention regulations
3351	Copper rolling and drawing	inorganics VOCs	B D	Minimize outdoor storage and control storm water runoff. Pre-treat process wastewater prior to discharge to POTW	40 CFR 468 and State or federal Storm water pollution prevention regulations
3353	Aluminum sheet, plate and foil Manufacture	Metals and minerals Solvents and other VOCs	B D	Minimize outdoor storage and control storm water runoff. Pre-treat process wastewater prior to discharge to POTW	40 CFR 467 and State or federal Storm water pollution prevention regulations

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
3357	Nonferrous wire drawing and insulating manufacture	Inorganics, metals VOCs and solvents	B D	Minimize outdoor storage and control storm water runoff. Pre-treat process wastewater prior to discharge to POTW	40 CFR 471 and State or federal Storm water pollution prevention regulations
3399	Primary metal products manufacture	Inorganics, metals VOCs and solvents	B D	Minimize outdoor storage and control storm water runoff. Pre-treat process wastewater prior to discharge to POTW	40 CFR 464 and State or federal Storm water pollution prevention regulations
3412	Metal barrels, drums and pails manufacture	inorganics VOCs	B D	Minimize outdoor storage and control storm water runoff. Pre-treat process wastewater prior to discharge to POTW	40 CFR 464 and State or federal Storm water pollution prevention regulations
3423	Hand and edge tools manufacture	inorganics VOCs	B D	Minimize outdoor storage and control storm water runoff. Pre-treat process wastewater prior to discharge to POTW	40 CFR 464 and State or federal Storm water pollution prevention regulations
3429	Hardware manufacture	Metals	B	Minimize outdoor storage and control storm water runoff. Pre-treat process wastewater prior to discharge to POTW	40 CFR 464 and State or federal Storm water pollution prevention regulations
3442	Metal doors, sash, and trim Manufacture	inorganics VOCs	B D	Minimize outdoor storage and control storm water runoff. Pre-treat process wastewater prior to discharge to POTW	State or federal Storm water pollution prevention regulations
3443	Fabricated plate work (boiler shops) manufacture	inorganics VOCs	B D	Minimize outdoor storage and control storm water runoff. Pre-treat process wastewater prior to discharge to POTW	40 CFR 464 and State or federal Storm water pollution prevention regulations
3444	Sheet metal manufacture	Metals and TSS VOCs and metal etch	B	Minimize outdoor storage and control storm water runoff. Pre-treat process wastewater prior to discharge to POTW	40 CFR 464 and State or federal Storm water pollution prevention regulations
3449	Miscellaneous metal work manufacturing	inorganics VOCs	B D	Minimize outdoor storage and control storm water runoff. Pre-treat process wastewater prior to discharge to POTW	40 CFR 464 and State or federal Storm water pollution prevention regulations
3451	Screw machine products Manufacture	inorganics VOCs	B D	Minimize outdoor storage and control storm water runoff. Pre-treat process wastewater prior to discharge to POTW	40 CFR 464 and State or federal Storm water pollution prevention regulations
3469	Metal stampings Manufacture	inorganics	B	Minimize outdoor storage and control storm water runoff. Pre-treat process	40 CFR 464 and

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
		VOCs	D	wastewater prior to discharge to POTW	State or federal Storm water pollution prevention regulations
3471	Plating and polishing manufacture	Inorganics, metals	B	Minimize outdoor storage and control storm water runoff. Pre-treat process wastewater prior to discharge to POTW	40 CFR 413 and
		VOCs and metal etch	D		State or federal Storm water pollution prevention regulations
3479	Metal coating and allied services	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	40 CFR 433 and
		VOCs	D		State or federal Storm water pollution prevention regulations
3494	Valves and pipe fittings Manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	40 CFR 464 and
		VOCs	D		State or federal Storm water pollution prevention regulations
3497	Metal foil and leaf manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	40 CFR 433 and
		VOCs	D		State or federal Storm water pollution prevention regulations
3499	Fabricated metal products	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
		VOCs	D		
3523	Farm machinery and equipment Manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
		VOCs	D		
3524	Lawn and garden equipment manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
		VOCs	D		
3531	Construction machinery manufacturing	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
		VOCs	D		
3534	Elevators and moving stairway manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
		VOCs	D		
3535	Conveyors and conveying equipment manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
		VOCs	D		
3537	Industrial trucks and tractors manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
		VOCs	D		
3548	Welding apparatus manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
		VOCs	D		
3559	Special industries machinery manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
		VOCs	D		
3561	Pumps and pumping equipment manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
		VOCs	D		
3566	Speed changers, drives and gears Manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
		VOCs	D		
3585	Refrigeration and heating equipment Manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
		VOCs	D		
3592	Carburetors, pistons, rings and valves Manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
		VOCs	D		
3593	Fluid power cylinders and actuators Manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
		VOCs	D		
3599	Machinery, except electrical wiring Manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
		VOCs	D		
3612	Transformers manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
		VOCs	D		
3613	Switchgear and switchboard apparatus manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
		VOCs	D		
3621	Motors and generators manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
		VOCs	D		
3630	Household appliances manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
		VOCs	D		
3641	Electric lamp manufacture	inorganics	B	40 CFR 469	State or federal Storm water pollution prevention regulations
		VOCs	D		
3643	Current carrying wiring devices Manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	40 CFR 469 and
		VOCs	D		State or federal Storm water pollution prevention regulations
3644	Non-current carrying wiring devices Manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
		VOCs	D		
3646	Commercial lighting manufacture	inorganics	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	40 CFR 469 and
		VOCs	D		State or federal Storm water pollution prevention regulations

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
3672	Cathode ray TV picture tubes manufacture	inorganics VOCs	B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	40 CFR 469 and State or federal Storm water pollution prevention regulations
3691	Storage batteries manufacture	Inorganics, caustics VOCs	B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct. Minimize outdoor storage	40 CFR 461 and State or federal Storm water pollution prevention regulations
3694	Engine electrical equipment manufacture	inorganics VOCs	B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	40 CFR 469 and State or federal Storm water pollution prevention regulations
3711	Motor vehicles and car bodies manufacture	inorganics VOCs	B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
3713	Truck and bus bodies manufacture	inorganics VOCs	B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	40 CFR 464 and State or federal Storm water pollution prevention regulations
3714	Motor vehicle parts and accessories manufacture	inorganics VOCs	B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	40 CFR 464 and State or federal Storm water pollution prevention regulations
3715	Truck trailers manufacture	inorganics VOCs	B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
3721	Aircraft manufacture	inorganics VOCs	B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	40 CFR 464 and State or federal Storm water pollution prevention regulations
3724	Aircraft engines and accessories manufacture	inorganics VOCs	B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	40 CFR 464 and State or federal Storm water pollution prevention regulations
3728	Aircraft equipment manufacture	inorganics VOCs	B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	40 CFR 464 and State or federal Storm water pollution prevention regulations
3732	Boat building and repairing shop	inorganics VOCs	B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct. Recycle where possible. Manage chemicals carefully	State or federal Storm water pollution prevention regulations
3743	Railroad equipment manufacture	Inorganics, metals	B	Manage wastes properly and treat process wastewater prior to discharge to a POTW	40 CFR 464 and

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
		VOCs	D	or direct	State or federal Storm water pollution prevention regulations
3751	Motorcycles, bicycles, and parts manufacture		B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	40 CFR 464 and State or federal Storm water pollution prevention regulations
3792	Travel trailers and campers manufacture	inorganics VOCs	B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
3795	Tanks and tank components manufacture	inorganics VOCs	B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	40 CFR 464 and State or federal Storm water pollution prevention regulations
3799	Transportation equipment manufacture	inorganics VOCs	B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	40 CFR 464 and State or federal Storm water pollution prevention regulations
3824	Fluids meters and counting devices manufacture	inorganics VOCs	B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
3841	Surgical and medical instruments manufacture	inorganics VOCs	B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
3842	Surgical appliances and supplies manufacture	inorganics VOCs	B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
3991	Brooms and brushes Manufacture	inorganics VOCs	B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
3993	Signs and advertising Manufacture	inorganics VOCs	B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	40 CFR 459 and State or federal Storm water pollution prevention regulations
3999	Manufacturing industries Nec	inorganics VOCs	B D	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
4013	Switching and terminal services			Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
4110	Local and suburban transportation			NA	
4171	Bus terminals	Sanitary wastes	A	Discharge to a POTW. Maintain secondary containment for fuel storage and fueling areas	

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
		VOCs from maintenance	D		
4212	Local trucking without storage	VOCs	D	Discharge to a POTW	State or federal Storm water pollution prevention regulations
4220	Public warehouse			No discharge except storm water runoff	State or federal Storm water pollution prevention regulations
4221	Warehouse			No discharge except storm water runoff	State or federal Storm water pollution prevention regulations
4226	Special warehousing			No discharge except storm water runoff	State or federal Storm water pollution prevention regulations
4230	Trucking terminals	VOCs from maintenance	D	Discharge to a POTW. Maintain secondary containment for fuel storage and fueling areas	40 CFR 442 and State or federal Storm water pollution prevention regulations
4441	River	Effluent from industries and non-point sources	ALL	Control storm water runoff into the river. Control discharges from point sources into the river. Use good erosion control practices	Water Quality Standards NPDES rules
4463	Marine	Effluent from industries and non-point sources	ALL	Control storm and process water discharges to the water body. Use good erosion control practices	Water Quality Standards NPDES rules
4582	Airports and flying fields	VOCs Inorganics	D B	Discharge to a POTW. Maintain secondary containment for fuel storage and fueling areas	State or federal Storm water pollution prevention regulations
4583	Airport terminals	Inorganics VOCs	B D	Discharge to a POTW. Maintain secondary containment for fuel storage and fueling areas	State or federal Storm water pollution prevention regulations
4600	Pipeline (petroleum, chemical)	Inorganics VOCs	B D	Maintain and inspect. Effect repairs promptly	
4789	Pipeline terminal	Inorganics VOCs	B D	Maintain secondary containment for fuel storage and fueling areas. Maintain and inspect. Effect repairs promptly	
4931	Electric services	Inorganics VOCs	B D	Maintain secondary containment for fuel storage and fueling areas. Maintain and inspect. Effect repairs promptly.	
4932	Gas and other services	Inorganics VOCs	B D	Maintain secondary containment for fuel storage and fueling areas. Maintain and inspect. Effect repairs promptly	
4939	Combination utility services	Inorganics VOCs	B D	Maintain secondary containment for fuel storage and fueling areas. Maintain and inspect. Effect repairs promptly	
4941	Water supply	Inorganics VOCs	B D	Manage sludge properly. Minimize storm water contact with chemicals	KAR 28-15 and State or federal Storm water pollution prevention regulations

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
4952	Sewerage systems	Inorganics VOCs	B, B*, B1 D	Manage sludge properly. Minimize storm water contact with chemicals	KAR 28-16 and State or federal Storm water pollution prevention regulations
4953	Refuse systems	Inorganics Semi volatiles VOCs	B C D	Protect for contact with storm water. Maintain control of wastes.	40 CFR 445 and State or federal Storm water pollution prevention regulations
4971	Irrigation systems	Nitrates, phosphorous, salts	B, B*, B1	Tail water collection. Efficient use of water. Maintain system	USDA rules
5030	Lumber and construction materials	Inorganics VOCs	B D	Discharge to POTW	
5070	Hardware, plumbing and heating equipment wholesale trade			Discharge to POTW	
5082	Construction and mining machinery			Discharge to POTW	
5093	Scrap and waste materials	Metals, TSS	B	Minimize contact with storm water	State or federal Storm water pollution prevention regulations
5171	Petroleum bulk stations and terminals	Inorganics VOCs	B D	Maintain secondary containment for fuel storage and fueling areas. Maintain and inspect. Effect repairs promptly	State or federal Storm water pollution prevention regulations
5191	Farm supply retail	Nitrates, phosphorous Pesticides, semi volatiles VOCs	B, B*, B1 C, C* D	Discharge to POTW	
5261	Retail nursery or garden store	Nitrates, phosphorous Pesticides, semi volatiles VOCs	B, B1, B* C, C* D	Minimize use of chemicals and contact of chemically treated areas with storm water runoff	
5261	Christmas tree farm	Nitrates, phosphorous Pesticides, semi volatiles VOCs	B, B1, B* C, C* D	Minimize use of chemicals and contact of chemically treated areas with storm water runoff	
5541	Gasoline service station	Inorganics VOCs	B D	Maintain area to minimize fuel contamination	
5719	Misc. home furnishing store			Discharge to POTW	
5999	Miscellaneous retail			Discharge to POTW	

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
6513	Apartment	Sanitary wastes	A	Discharge to POTW.	
6515	Mobile home park	Sanitary wastes	A	Discharge to POTW. Minimize use of lawn chemicals	KAR 28-5
		Fertilizers	B, B1, B*		
6541	Title abstract offices	sanitary	A	Discharge to POTW	
6552	Suburban housing	sanitary	A	Discharge to POTW. Minimize use of lawn chemicals	KAR 28-8
		fertilizers	B, B1, B*		
		pesticides	C*		
6553	Cemetery	fertilizers	B, B1, B*	Minimize use of lawn chemicals	KAR 28-9
		pesticides	C*		
6611	Combined real estate and insurance office	Sanitary	A	Discharge to POTW.	
6732	Education or religious institution	Sanitary	A	Discharge to POTW.	
7010	Hotel or motel	Sanitary	A	Discharge to POTW.	
7033	Recreational vehicle camp	sanitary	A	Discharge to POTW. Minimize use of lawn chemicals	
		fertilizers	B, B1, B*		
		pesticides	C*		
7033	Camp ground	sanitary	A	Discharge to POTW. Minimize use of lawn chemicals	KAR 28-5
		fertilizers	B, B1, B*		
		pesticides	C*		
7210	Laundry self service	Sanitary	A	Discharge to POTW.	
		Nitrates phosphorous	B, B1		
		VOCs	D		
7216	Dry cleaner	Nitrates, phosphorous	B	Discharge to POTW. Recycle chemicals	
		VOCs	D		
7261	Funeral service and crematories	sanitary	A	Discharge to POTW.	
		inorganics	B		
			D		
7384	Photofinishing laboratory		B	Discharge to POTW. Recycle chemicals	CFR 40 459
			D		
7391	Research lab		ALL	Discharge to POTW. Recycle chemicals	

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
7519	Utility trailer rental			Discharge to POTW	
7538	Auto truck repair service	Inorganics VOCs	B D	Discharge to POTW. Manage oil products and used oil so that it is not in contact with water	40 CFR 442 and
7542	Car wash	Inorganics VOCs	B D	Install and maintain sediment and grease traps where appropriate	40 CFR 442
7641	Re-upholstery and furniture repair			Discharge to POTW	
7999	Amusement and recreation area	sanitary	A	Discharge to POTW. Minimize use of lawn chemicals	KAR 28-8
8060	Hospital	sanitary	A	Discharge to POTW. Recycle chemicals where possible	40 CFR 460 and State or federal Storm water pollution prevention regulations
8211	School	sanitary	A	Discharge to POTW. Minimize use of lawn chemicals	
8221	College or university	sanitary	A	Discharge to POTW. Minimize use of lawn chemicals	
8411	Museums and art galleries	sanitary	A	Discharge to POTW. Minimize use of lawn chemicals	
8421	Botanical gardens	fertilizers pesticides VOCs	B, B1, B2 C* D	Discharge to POTW. Minimize use of lawn chemicals. Use good erosion control practices	
8512	Restaurant	Sanitary oil and grease	A	Discharge to a POTW. Maintain grease traps	
8661	Church	Sanitary	A	Discharge to a POTW	
9100	Government office bldg	Sanitary	A	Discharge to a POTW	
9223	Prison	Sanitary	A	Discharge to a POTW	
9532	Urban and community development	Fertilizers Semi volatiles and pesticides	B, B2, B* C, C*	Use good erosion control practices and minimize storm water contact with contaminants	KAR 28-5
9711	Military base office bldgs	Sanitary	A	Discharge to a POTW	KAR 28-5
211	Cattle farm	Sanitary Fertilizers TSS	A B, B1, B2, B*	Treat wastewater. Maintain area to minimize runoff of sediment	40 CFR 412
212	Cattle working area	Sanitary Fertilizers TSS	A B, B1, B2, B*	Treat wastewater. Maintain area to minimize runoff of sediment	40 CFR 412
723	Crop prep for market	TSS	B	Unknown	
741	Veterinary services farm	sanitary Inorganics TSS	A B	Discharge to POTW	

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
742	Veterinary services special	Sanitary	A	Discharge to POT	
		Inorganics TSS	B		
821	Forest nurseries and seed gathering	Fertilizers	B, B1, B2, B*	Use good erosion control practices and minimize storm water contact with contaminants	
		Semi volatiles and pesticides	C, C*		
843	Extraction of pine gum	VOCs	D		
849	Gathering of forest products	Fertilizers	B, B1, B2, B*	Use good erosion control practices and minimize storm water contact with contaminants	
		pesticides	C*		
851	Forestry services	Fertilizers	B, B1, B2, B*	Use good erosion control practices and minimize storm water contact with contaminants	
		pesticides	C*		
7531	Top and body repair shops	Inorganics	B	Discharge to POTW. Recycle where appropriate. Properly maintain oil product and waste.	
		VOCs	D		
7531	Auto body repair and paint service	Inorganics	B	Discharge to POTW. Manage paint and solvent wastes properly	
		VOCs	D		
7535	Paint shops	Inorganics	B	Discharge to POTW. Manage paint and solvent wastes properly	
		VOCs	D		
A	Construction equipment dealer			Discharge to POTW	
7948	Auto race track			Discharge to POTW. Minimize use of lawn chemicals. Use good erosion control practices	
241	Dairy farm	Sanitary	A	Collect and treat process wastes. Use good erosion control practices. Minimize storm water contact with contaminants.	40 CFR 405
		fertilizers	B, B1, B2, B*		
752	Dog kennel	Sanitary	A	Collect and treat wastes.	
		Fertilizers	B, B1, B2, B*		
AE	Dog race track	Sanitary	A	Discharge to POTW. Minimize use of lawn chemicals. Use good erosion control practices	
		Fertilizers	B, B1, B2, B*		
AF	Electric power lines			NA	
AG	Electric transformer substation	inorganics	B	Maintain good housekeeping practices. Provide secondary containment for oil containing units	
AH	Farmstead	Sanitary	A	Maintain good erosion control measures.	KAR 28-5
		Fertilizers	B, B1, B2, B*		
AI	Feed mill	Inorganics, TSS	B	Maintain grounds to minimize contact of storm water with grain.	40 CFR 406 and

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
					State or federal Storm water pollution prevention regulations
AJ	Horse race track	Sanitary Fertilizers	A B, B1, B2, B*	Discharge to POTW. Minimize use of lawn chemicals. Use good erosion control practices	
AK	House (non-farm residence)	Sanitary Fertilizers	A B, B1, B*	Site wastewater treatment system appropriately. Manage wastes properly	
AL	Irrigation well	Nitrates, phosphorous TSS	B, B1, B*	Protect wellhead from contamination.	
AM	Railroad track	Inorganics VOCs	B D	Maintain good erosion control measures. Keep the track area free of material that could contaminate storm water	
AN	Railroad yard	Inorganics VOCs	B D	Maintain good erosion control measures. Keep the track area free of material that could contaminate storm water	
AO	Salvage yard	inorganics	B	Control storm water contact to prevent contact	
AP	Telephone lines			NA	
AQ	Weed control-vegetables	pesticides	C*	Minimize the use of chemicals and control runoff	
AR	Highway maintenance facility	fertilizers pesticides	B, B1, B2, C*	Store and maintain equipment and chemicals appropriately. Minimize outdoor storage	
175	Orchard	fertilizers pesticides VOCs	B, B1, B2, B* C* D	Minimize the use of chemicals and pesticides. Maintain good erosion control practices	
AT	Municipal sewage treatment plant mechanical	Sanitary Nitrates, phosphorous	A B, B1, B2, B*	Treat the wastewater adequately. Manage sludge appropriately	40 CFR 122 and State or federal Storm water pollution prevention regulations
ATU	Municipal sewage treatment plant lagoon	Sanitary Nitrates, phosphorous	A B, B1, B2, B*	Treat the wastewater adequately. Manage sludge appropriately	40 CFR 122 and State or federal Storm water pollution prevention regulations
AV	Solid waste landfill	Nitrates, phosphorous VOCs	B, B1, B2, B* D	Control erosion. Maintain cover and stabilize final cover. Control storm water runoff to minimize contact with waste	40 CFR 445 and State or federal Storm water pollution prevention regulations
AW	Solid waste transfer station	Inorganics VOCs	B D	Control waste such that it does not come into contact with storm water	
AX	Urbanized area	Inorganics	B	Establish measures to minimize contamination of storm water. Use good erosion control practices. Establish rules to control the placement of materials that could contaminate storm water	State or federal Storm water pollution prevention regulations

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
		VOCs	D	contaminate storm water	
		Pesticides	C*		
AY	Incinerator	Inorganics	B	Minimize outdoor storage of wastes. Maintain good housekeeping in the area	40 CFR 444 and
		VOCs	D		State or federal Storm water pollution prevention regulations
AZ	Fuel storage tanks	Inorganics	B	Provide secondary containment for fuel tanks and fueling areas. Do not discharge contaminated storm water from the containment areas.	KAR 28-44 and
		VOCs	D		State or federal Storm water pollution prevention regulations
B	Landscape insects	Pesticides	C*	Minimize the use of chemicals, and minimize contact with storm water	
BA	Abandoned water well	Biological	A	Abandon the well properly, sealing the column to prevent contamination of the subsurface	KAR 28-30
		Onorganic	B		
BA	Wells	Biological	A	Protect the wellhead to prevent contamination of the well and the subsurface	KAR 28-30
		Inorganic	B		
BB	Construction project temporary equipment storage	Inorganic TSS	B	Use good housekeeping measures to minimize fuel spillage	
BC	CRP grassland	fertilizers	B, B1, B*	Maintain grass cover to minimize erosion	
BE	Gravel dredge	TSS	B	Protect from runoff	40 CFR 122
BI	Highway materials storage area	TSS	B	Protect from runoff	State or federal Storm water pollution prevention regulations
BJ	Highway rest area	Sanitary	A	Maintain lagoon or sanitary waste treatment area properly. Keep area free of trash	KAR 28-5
		Fertilizers	B, B1, B2, B*		
		Pesticides	C*		
3523	Farm equipment sales and service	inorganics	B	Discharge to POTW	
7699	Farm equipment sales and service	inorganics	B	Discharge to POTW	
5083	Farm equipment sales and service	inorganics	B	Discharge to POTW	
BL	Interstate highway	Fertilizers	B, B1, B2	Treat the wastewater adequately. Manage sludge appropriately Control use of ice melting chemicals where possible	
		Pesticides	C*		
BO	Nature center	Fertilizers	B, B1, B2, B*	Treat the wastewater adequately. Manage sludge appropriately	
		Pesticides	C*		

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
BP	Pesticide application equipment storage	Pesticides	C*	Store only clean equipment. Minimize outdoor storage	
BQ	Pond	Fertilizer runoff	B, B1, B2, B*	Maintain pond banks properly. Control chemical use in the area that could runoff into the pond	KAR 28-16
		Pesticides	C*		
5012	Recreational vehicle sales and repair	Inorganics	B	Discharge to a POTW. Store oils and lubricants properly	
7538	Recreational vehicle sales and repair	Inorganics	B	Discharge to a POTW. Store oils and lubricants properly	
5561	Recreational vehicle sales and repair	Inorganics	B	Discharge to a POTW. Store oils and lubricants properly	
BT	Retirement housing	Sanitary	A	Discharge to a POTW. Minimize the use of lawn chemicals.	
		Fertilizers	B, B1, B2, B*		
		Pesticides	C*		
BV	Road salt storage	Salt	B	Store and load to minimize contact with storm water	State or federal Storm water pollution prevention regulations
BW	Shooting range	Lead and other metals	B	Control run-on to range to minimize the potential for contamination of storm water	
BX	State park	Sanitary	A	Use good erosion control measures. Minimize the use of chemical fertilizers and pesticides.	
		Fertilizers	B, B1, B2, B*		
		Pesticides	C*		
7542	Truck wash	Nitrates, phosphorous and surfactants	B, B1, B2	Use grease and grit traps. Discharge to POTW.	40 CFR 442 and
		VOCs	D		State or federal Storm water pollution prevention regulations
BZ	Wetland	Nitrates, phosphorous and others	B, B1, B2, B*	Protect the wetland area	40 CFR 122
C	Landscape fungus and weeds	Fertilizers	B, B1, B2, B*	Minimize the use of chemicals and use good erosion control measures	
CB	Injection well	ALL	ALL	Inject only the substances permitted for the well. Protect the well head.	KAR 28-46
CC	Shopping center			Discharge to POTW. Minimize the use of lawn chemicals	
CD	Underground storage tanks	Semi volatiles	C	Maintain the tanks in accordance with existing rules. Monitor inventory. Install leak detection	KAR 28-44
		VOCs	D		40 CFR 279
4221	Grain elevator	TSS	B	Keep the area clean of grain. Use grease traps.	State or federal Storm water pollution prevention regulations
		VOCs	D		
CF	Junk yard	TSS	B	Control storm water run on to minimize the potential for contamination	State or federal Storm water pollution prevention regulations
CG	Retail operations building materials and garden supply	Fertilizers	B, B1, B2, B*	Discharge to POTW. Store garden supplies properly to minimize contact with storm water	

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
		Pesticides	C*		
CH	Retail operations accessory furniture stores			Discharge to POTW	
2677	Paper and allied products envelopes, bags	Inorganics VOCs	B D	Collect process wastewater and treat prior to discharge as necessary. Minimize outdoor storage	40 CFR 430 and State or federal Storm water pollution prevention regulations
2674	Paper and allied products envelopes, bags	Inorganics VOCs	B D	Collect process wastewater and treat prior to discharge as necessary. Minimize outdoor storage	40 CFR 430 and State or federal Storm water pollution prevention regulations
2673	Paper and allied products envelopes, bags	Inorganics VOCs	B D	Collect process wastewater and treat prior to discharge as necessary. Minimize outdoor storage	40 CFR 430 and State or federal Storm water pollution prevention regulations
CJ	Paper and allied products paperboard, containers and boxes	Inorganics VOCs	B D	Collect process wastewater and treat prior to discharge as necessary. Minimize outdoor storage	40 CFR 430 and State or federal Storm water pollution prevention regulations
CK	Nonmetallic minerals industrial sand	Minerals and TSS	B, B2	Protect outdoor storage to minimize contact with storm water	40 CFR 436 and State or federal Storm water pollution prevention regulations
CL	Health services hospitals nursing and personal care	sanitary	A	Discharge to POTW. Recycle chemicals where possible. Manage wastes properly	40 CFR 460 and State or federal Storm water pollution prevention regulations
2711	Printing and publishing photograving , commercial printing	Inorganics VOCs Semi volatiles	B D C	Recycle chemicals where possible. Discharge to POTW	40 CFR 459 and State or federal Storm water pollution prevention regulations
2752	Printing and publishing photograving , commercial printing	Inorganics VOCs Semi volatiles	B D C	Recycle chemicals where possible. Discharge to POTW	40 CFR 459 and State or federal Storm water pollution prevention regulations
2759	Printing and publishing photograving , commercial printing	Inorganics VOCs Semi volatiles	B D C	Recycle chemicals where possible. Discharge to POTW	40 CFR 459 and State or federal Storm water pollution prevention regulations

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
G	Health services office of physicians, dentists, optometrists	sanitary	A	Discharge to POTW	
H	Printing and publishing newspapers books greeting cards	Inorganics VOCs	B D	Discharge to POTW. Recycle chemicals where possible. Manage wastes properly	40 CFR 459 and State or federal Storm water pollution prevention regulations
I	Nonmetallic minerals crushed limestone fire clay	TSS	B	Manage outdoor storage to minimize contact with storm water	40 CFR 436 and State or federal Storm water pollution prevention regulations
J	Retail operations food automotive dealers merchandise	sanitary	A B	Discharge to POTW	
K	Wholesale distribution activities durable and non-durable goods		B	Discharge to POTW	
2048	Animal feeding operation	Sanitary Nitrates, phosphorous pesticides	A B, B1, B2, B* C*	Maintain animal feeding areas and feed storage areas to minimize contact with storm water. Collect and treat process wastes.	40 CFR 412 and State or federal Storm water pollution prevention regulations
M	Rural homestead	sanitary fertilizers	A B, B1, B2, B*	Discharge to a POTW or sanitary waste treatment system.	
N	Septic tank – lateral field	Sanitary Nitrates and phosphorous	A B, B*	Maintain the septic tank properly. Make sure the field is large enough and the land suitable	KAR 28-5
O	Drinking water treatment	Inorganic sludge	B	Manage chemicals and sludges appropriately	KAR 28-15
P	Paper and allied products pulp, board, and building paper	Inorganics VOCs	B D	Collect process wastewater and treat prior to discharge as necessary. Minimize outdoor storage	40 CFR 430 and State or federal Storm water pollution prevention regulations
Q	Historic waste dumps landfills	ALL	ALL	Maintain cover and monitor leachate migration	40 CFR 445 and State or federal Storm water pollution prevention regulations
191	Vegetable farm	fertilizers Pesticides	B, B1, B2, B* C*	Maintain good erosion control practices and minimize the use of chemicals	
S	Pet (cat, dog) insect control	pesticides	C*	Minimize the use of chemicals and prevent contact with water when freshly applied	
U	Lawn and turf	Fertilizers	B, B1, B2, B*	Minimize the use of chemicals and prevent contact with water when freshly applied	

Point Contaminant List

Code	Source	Potential Contaminant	Contaminant Category	Water Quality Protection Measure	Regulatory Authority
		Pesticides	C*		
V	Home and horticultural weed and insect control	Fertilizers	B, B1, B2, B*	Minimize the use of chemicals and prevent contact with water when freshly applied	
		Pesticides	C*		
Y	Lagoons and liquid waste	Sanitary	A	Maintain the lagoon or storage vessel properly. Control storm water run on and runoff to minimize contamination of storm water	KAR 28-5
		Nitrates, phosphorous etc.	B, B1, B2, B*		40 CFR 122
4953	Household hazardous waste collection center	ALL	A, B, B1, B2, B*,C,C*,D	Store wastes properly in order to minimize contact with storm water.	

Note: At the request of KDHE, all letter "codes" in the first column were added. These were assigned letters instead of SIC Codes because they either did not exist or there were too many codes to list that were applicable to the contaminant source (second column). Hence, they were designated with letters.

APPENDIX C

TRAINING

1 Major Water Bodies Training:

Major Water Body Training	No. of PWS	Location	Date	Time
Kansas R. Assurance District: (all surface water assessments)	5 PWS w/SW 5 PWS w/GW	Topeaka @ KDHE	8/8	10:00
Marias De Cygnes Assurance District	8 PWS	Ottawa	8/9	2:30
Neosho / Cottonwood Assurance District	19 PWS	Emporia	8/9	10:00
Kanopolis Reservoir	3 PWS	Salina	8/15	10:00
Arkansas River / Cheney / El Dorado	3 PWS	Wichita	8/16	10:00
Hillsdale Reservoir / Clinton Reservoir	7 PWS	Topeaka @ KDHE	8/6	2:00
Big Hill / Elk City	7 PWS	Chanute	8/20	2:30
Equus Beds	15 PWS	Halstead	8/21	10:00

2 Regional Training for TAPS / PWSs:

Location	Date	Time
Topeka @ KDHE	8/6	10:00
Dodge	8/13	10:00
Hays	8/14	10:00
Chanute	8/20	10:00

3 Training location Contacts

Location	Contact Name	Phone #	Dates	Times
Topeka @ KDHE	Rob Bielfus	785-296-5535	8/6 TAP	10:00
			8/6 MWB	2:00
			8/8 MWB	10:00
Ottawa	Dale Howard	785-242-2190	8/9 MWB	2:30
Emporia	Ron Rhodes	620-342-3413	8/9 MWB	10:00
Salina	Jim Wendel	785-826-7305	8/15 MWB	10:00
Wichita	Jerry Blain	316-268-4578	8/16 MWB	10:00
Chanute	Rob Bielfus	785-296-5535	8/20 TAP	10:00
			8/20 MWB	2:30
Dodge City	Ken Zielke	620-225-8176	8/13 TAP	10:00
Hays	Paul Montoia	785-628-7300	8/14 TAP	10:00
Halstead	Mike Dealy	316-835-2224	8/21 MWB	10:00

MWB = Major Water Body

APPENDIX D

PUBLIC INFORMATION

***KANSAS SOURCE WATER ASSESSMENT
PROGRAM
TECHNICAL GUIDANCE***



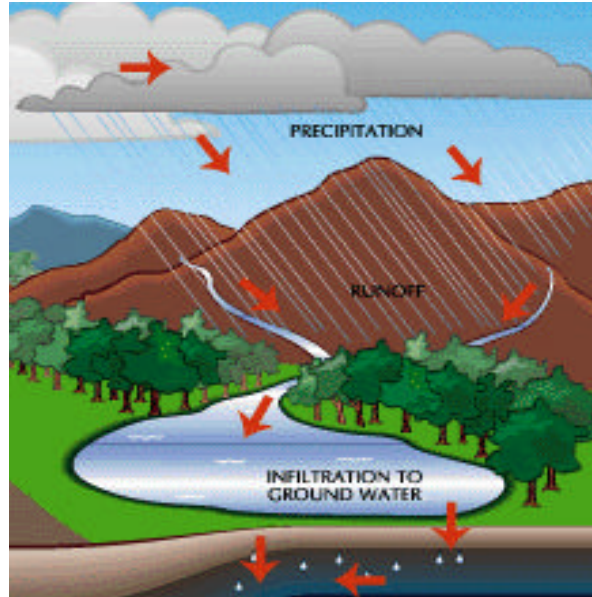
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THE BASICS OF HYDROLOGY

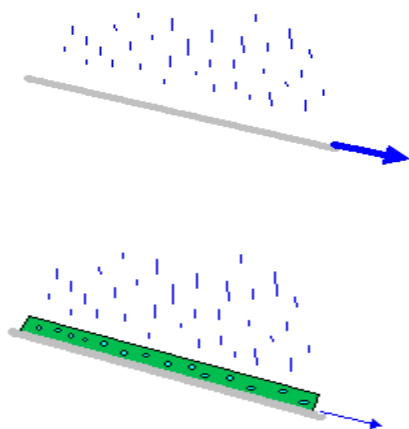
~ Infiltration and Runoff ~

The hydrologic cycle illustrates the path of water through the earth system and has five main constituents: precipitation, condensation, infiltration, runoff (urban and rural), and evaporation. Precipitation, the origin of surface and groundwater, gives birth to infiltration and runoff. Infiltration and runoff are of main concerns for this document and are discussed below.



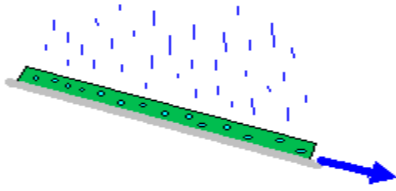
Infiltration occurs when precipitation finds its way into the ground. Infiltration is dependent on the intensity of the rain, permeability of the soil, and soil saturation as shown in Figure 1 below. After a certain amount of time, the soil loses its infiltrating capacity and ponding or runoff begins. Rainfall intensity can be too heavy for infiltration to commence. Infiltration is also controlled by factors such as permeability and porosity, soil structure and texture, soil moisture, and the amount of vegetation in an area.

Figure 1



Picture pouring water over this sheet of galvanized steel.

Imagine placing a sponge and pouring more water over it.



Now imagine pouring even more water on the steel sponge.

The sponge in Figure 1 represents the soil and the steel represents an impervious layer of rock beneath the soil. The first picture represents a rapid rainfall where no infiltration would take place. The second picture would represent a dry soil layer with rock beneath it that infiltrates most of the rainfall. Only a small amount of runoff would occur. And the third picture would indicate much more runoff and less infiltration since the sponge is saturated.

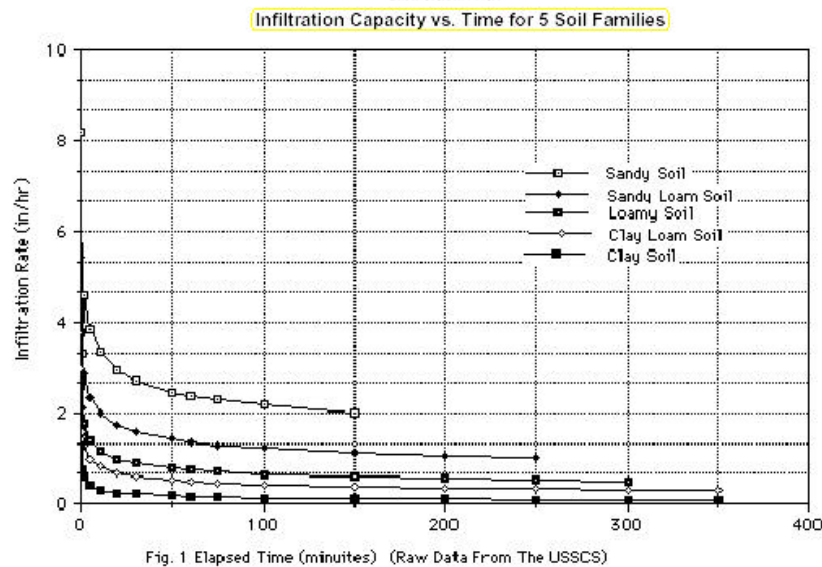
Permeability, a measure of the soil's porosity, is important when discussing infiltration. Soils are permeable due to interconnected voids through which water can flow and the porosity of a soil is indicative of the water-bearing capacity in geologic formations. Permeable soils tend to be porous and generally result in higher infiltration rates, while less permeable soils are not as porous and therefore result in lower infiltration rates.

Soil structure and texture control infiltration rates as well. Course-grained soils are gravelly and sandy in nature. These soils tend to have higher infiltration rates due to the rather large pore

spaces that exist in the soil. Figure 2 suggest infiltration rates for several different soils. Course grained soils typically have a natural moisture content in a saturated state

ranging from 15% to 30%. The relatively low moisture content allows for more infiltration. Whereas fine-grained soils, which consist of clays and silts, result in lower

Figure 2



infiltration rates due to a lack of pore spaces. Oddly enough, coarse-grained soils may pond much more rapidly because of a smaller amount of total pore space in a unit volume. Fine-grained soils have a natural moisture content ranging from 30% to 120%. A soil with high moisture content will not allow water to infiltrate easily and result in ponding or runoff.

Vegetation can assist in the infiltration process. Both plant and tree roots help loosen the soil considerably resulting in higher infiltration rates. Foliage and canopy reduce the chance for infiltration by terminating the impact of falling rain which could otherwise seal soil passages. This "interception" serves as a good buffer for soil erosion and a catalyst for runoff. However, this type of runoff would be more closely associated with rural runoff.

Two types of runoff that occur in the hydrologic cycle are urban and rural. As stated above, rural runoff occurs outside of a city or suburb of a city as shown in Figure

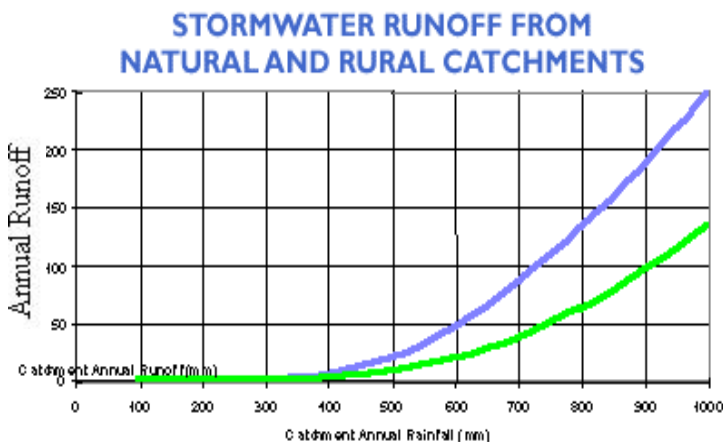


Figure 3

3. The biggest issue concerning rural runoff is contaminants from dairy farms, livestock, and crops that eventually accumulate in small streams, ponds, lakes, and rivers. Natural landscapes such as forests, wetlands, and grasslands tend to be porous and allow the precipitation to

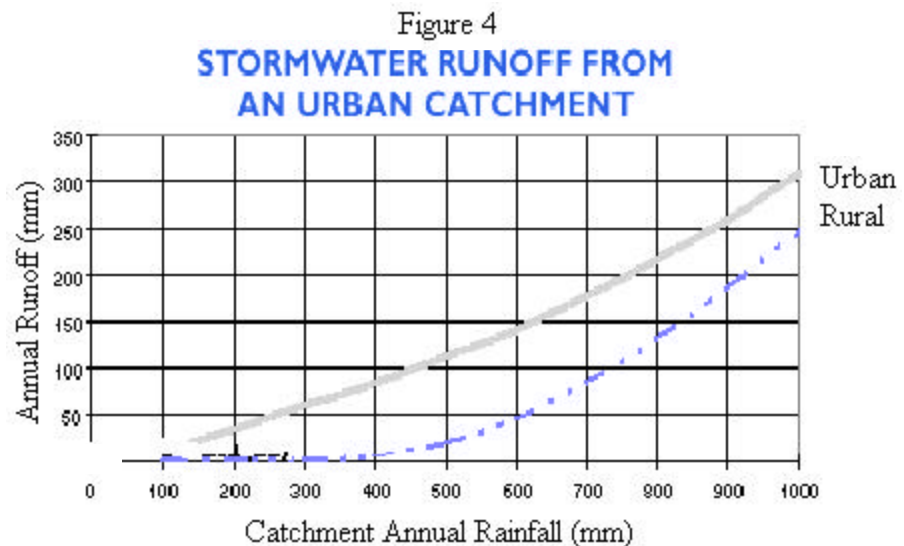
infiltrate slowly into the ground and minimize runoff.

Rural runoff occurs when the catchment profile becomes saturated and infiltration ceases. As was indicated earlier, more in vegetation a catchment profile results in higher infiltration rates. In retrospect, an adverse condition exists when the vegetation has been eradicated causing increased runoff. The soil left behind becomes compacted due to heavy machinery, stockpiling, and tilling. To further illustrate this condition, Figure 3 above indicates the increase in runoff due to these practices. The lower curve illustrates a naturally vegetative catchment and the upper curve shows a cleared rural catchment in the Mount Lofty Range.

With the runoff, comes erosion and transportation of sediment into our waterways. This sediment is a mechanism to transport pollutants, typically nitrogen, phosphorus, and pesticides that attach to the particles during periods of runoff.

Typical urban landscape is thought of as nearly impervious due to the amount of roads, bridges, parking lots, and buildings. These structures rarely allow water to penetrate their exterior and green space varies based on land use and development. This causes runoff to accumulate above the surface. Cities install sewer systems to channel this runoff to a waterway where it has the potential to increase bank erosion and introduce pollutants to the aquatic life, both plant and animal. Whether it be oil leaking from your car or the waste from your pets, the contaminants in the runoff all end up in the waterway.

Effect of urban areas on runoff is shown in Figure 4. A typical urban block will generate as much as 9 times more runoff than vegetative catchment of the same size. The dashed line shows the runoff for a



typical cleared rural catchment and the solid line exemplifies the urban runoff. Review of Figure 4 shows the following:

- ❖ The shape of the curve is close to linear due to the small loss rates.
- ❖ Urban runoff is generally greater than that of the undeveloped catchment.
- ❖ The efficiency of the catchment to convert rainfall to runoff depends on:
 - ◆ the proportion of paved area within the landscape.
 - ◆ the connection of this paved area to the storm water collection system.

DIVERSION WORKS

~ Water Wells ~

A typical pumping rate for high volume (municipal, industrial, and irrigation) wells in Kansas is about 1000 gallons per minute. A high rate such as this can have many effects on the water table it resides in, especially in the vicinity of the well. The main effect is drawdown. A substantial amount of drawdown in a short amount of time will result in longer recovery times. Therefore, it is very important to place wells in areas that contain sufficient saturation.

Even at maximum drawdown the pump should remain submerged. Several components of a typical relationship that exists

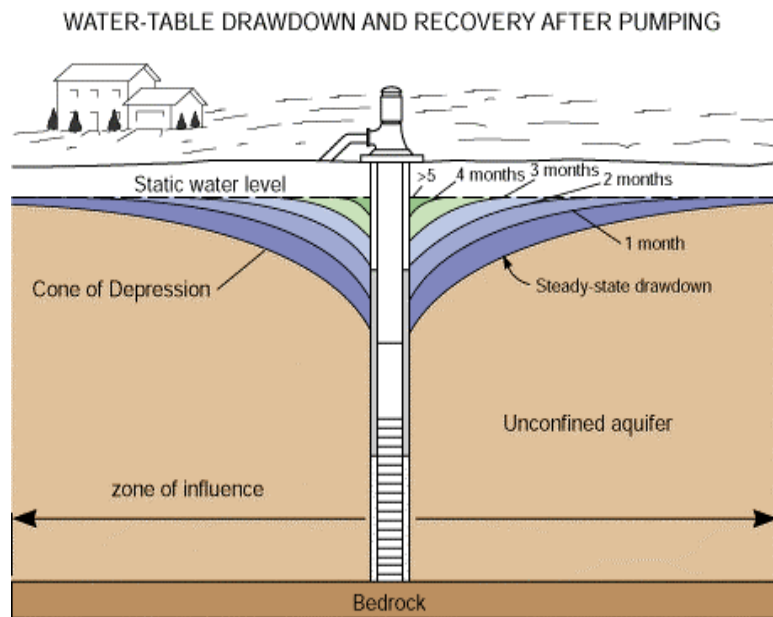


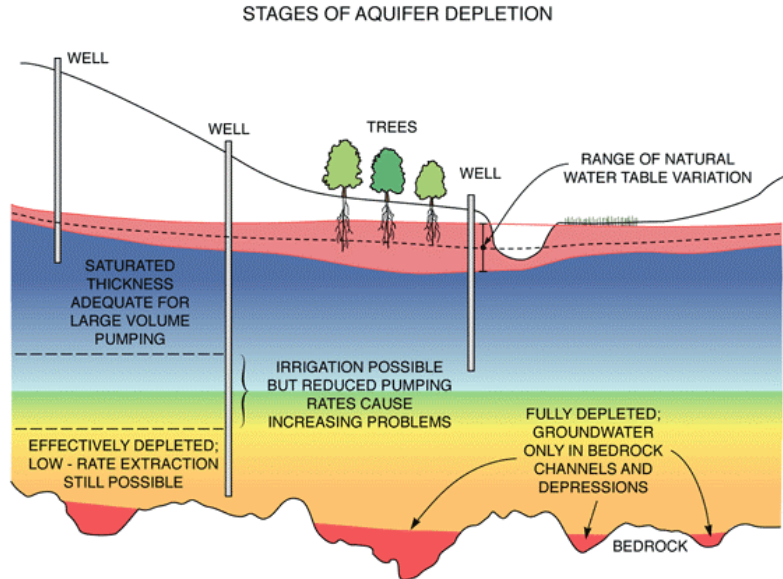
Figure 1

between a well and a water table are shown in Figure 1. This figure displays an unconfined aquifer. When pumping commences a steady state drawdown occurs. The drawdown develops a cone of depression. The zone of influence is the portion where the depression occurs. The figure further shows the gradual recovery of the system, possibly depending on the severity of the pumping, infiltration, and pumping by others. Lateral flow into the well's zone of influence continues when pumping ceases.

An actual well schematic is listed in Attachment 1. Pertinent information includes precise location, well depth, static water level, well use, casing, grout information, contamination information, screen and perforation data, and a lithologic log that indicates the depths and locations of various soil layers.

The stages of aquifer depletion are shown in Figure 2. This is a common problem in Kansas. Review of Figure 2 shows how pumping desired quantities of water causes over-pumping of the aquifer and decreases the saturated thickness. Figure 2 suggests

Figure 2



alternatives that may be utilized for effective management of the well and potential water reserves that could be used to replenish the groundwater. Aquifer management and aquifer recharge

can be used to correct over-pumped aquifers based on surface and bedrock topography, alluvial channels, aquifer characteristics, and the use of the well(s).

Irrigation pumping is a primary application for water wells. It requires large amounts of water in relatively short time spans. Irrigation pumping can create large drawdowns and, as a result, requires a certain minimum saturated thickness. Thirty feet is a typical minimum saturated thickness for large volume producing wells. Every aquifer is different and appropriate minimum levels must be considered in well design and operation. Irrigation water levels are usually measured during the winter months when irrigation pumping is at a minimum and it is unwise to assume the water table will always return to its original level. Municipal and industrial users, also primary water consumers may not be as influential due to their potential sporadic use that is usually distributed more evenly throughout the year.

Dynamic groundwater flow induced by pumping is depicted in Figure 3 and represents a sectional view of the subsurface and the capture zone. The displayed capture zone only shows half, the full one would include the addition of the mirrored half. The black arrows

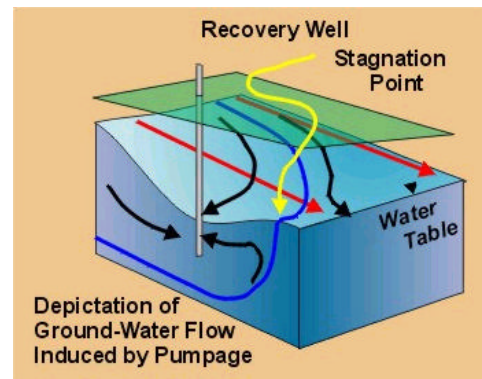
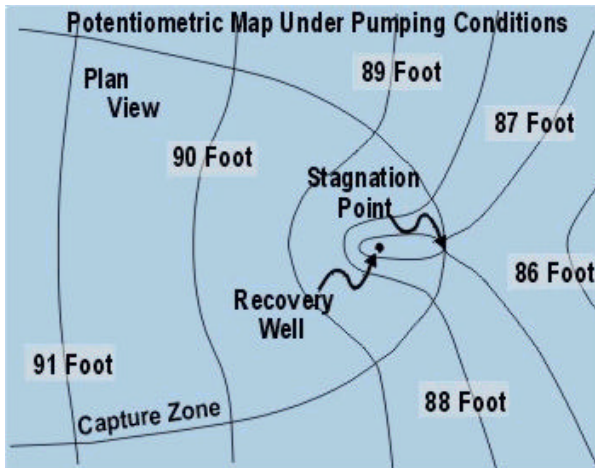


Figure 3

indicate the groundwater flow path which flow one of two ways; 1) along the face of the water table, 2) or along the vertical gradient. Well pumping modifies the water table gradient and ultimately changes the direction of the groundwater flow. As seen in Figure 1, the maximum drawdown always appears nearest to the well.

Figure 4



Another method to view groundwater flow is an equipotential map, as shown in Figure 4. This figure shows an equipotential map and plan view of the surface of the water table when water is being pumped from a well. An equipotential map is a much better tool used to illustrate groundwater flow paths. It is important to point out that the

groundwater flow path is always perpendicular to the equipotential map. As you can see, the capture zone is parabolic in shape. From the equipotential map and groundwater flow data, it is much easier to see that the flow paths within the capture zone are headed toward the pumping well. All groundwater flow paths that exceed the boundaries of the capture zone are influenced, but not absorbed by the well. As the displacement from the well to any point beyond the capture zone increases, the equipotential map will remain unchanged and look more and more like the conditions a non-pumping well creates.

Equipotential lines behave just as contour lines of a topographic map that are more closely spaced around the steepest terrain as shown in Figure 5. Equipotential lines that appear to be close to one another indicate fluctuating elevations in the water table, producing higher water velocities through these areas under pumping conditions. The stagnation point, the place between the 87 and 86 equipotential lines, is spaced much further apart resulting in slower flow rates. It is the most

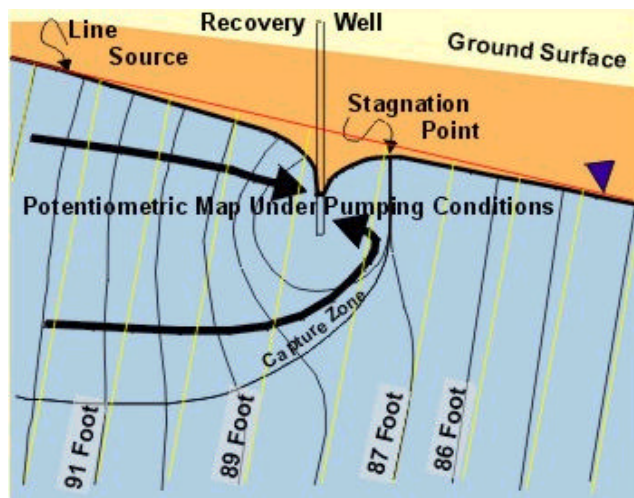


Figure 5

down-gradient point within the capture zone and has the highest water table elevation just to the right and left of it. All the groundwater to the right of the 86 foot line will not be pumped by the well because of this.

The up-gradient direction, the location with the greatest total head and highest water table elevation, is the source for most the water that the well will pump. The line source is the point on the water table that is up-gradient and where no measurable drawdown exists. Everything above the line source remains unchanged. The groundwater flow is accelerated because of the pumping of the well from the line source to the well.

A dynamic groundwater flow under non-pumping conditions is shown in Figure 6. In this situation, all the groundwater that flows beyond the well comes from the up-gradient direction, basically it can be

thought of a stream – they always flow downhill. The well only receives the water from the up-gradient direction. Excess water that flows into the well does not come from the down-gradient direction. Any additional water still comes from “up-stream” only in larger amounts. Its influence will increase the

volume of water by increasing the wells pumping capacity. The line indicates the boundary of the capture zone. All water residing within this zone will be captured by the well. Groundwater outside the capture zone flows along the outside perimeter and plays no role in this system. However, “these flow paths can be used to advantage to exhaust contaminants by flushing the soils with clean water” (Introduction to Basic Ground-

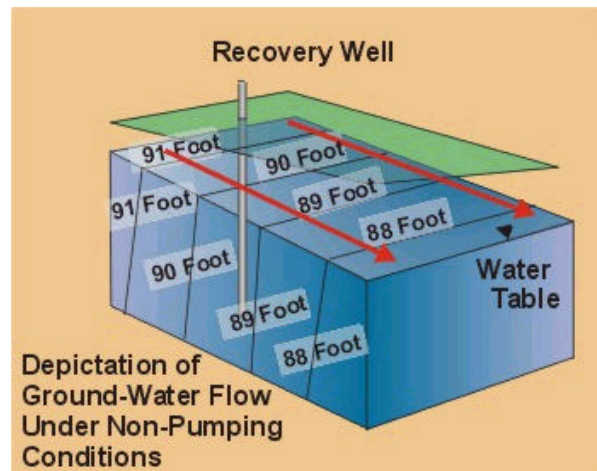
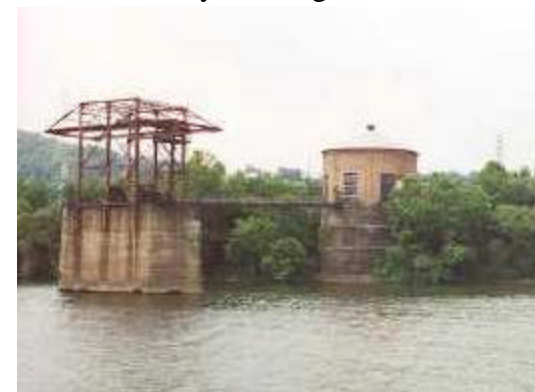


Figure 6



Water Flow). The intensity of the groundwater flow path decreases as the distance to the well increases.

Surface water intakes primarily provide water supply from rivers or lakes to a water plant or power plant. Surface water

intakes are designed to meet the specific needs of the operator. The construction of surface water intakes must meet hydraulic design criteria and minimize environmental impact.

POLLUTION SOURCES

Pollution exists in many different forms and can be transmitted to the groundwater in just as many ways. Better planning and construction will prevent sources of pollution from infiltrating the groundwater. Some of the main groundwater pollution sources include underground storage tanks (USTs), industrial facilities, feed lots and agriculture, wastewater treatment plants (WWTP), and urban sources.

The potential pollution sources identified by the Automated Source Water Assessment Tool (ASWAT) come from a variety of sources including KDHE's data base for permitted facilities, a database of numerous industrial and commercial facilities, and ESRI's Business Analyst. Facilities permitted by KDHE include landfills, Wastewater Treatment Plants (WWTP), facilities with UST's, RCRA facilities, and CAFO's to name a few. The listing of a facility site does not indicate that it is a pollution source but that it has the potential to be a source of pollution to a water supply

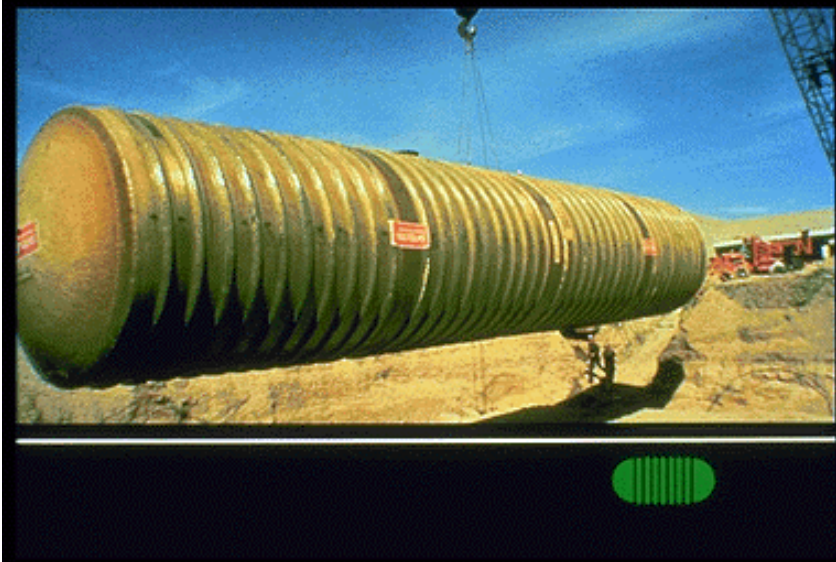
~ Underground Storage Tanks (UST) ~

A UST system is a tank and its respective piping, or combination of tanks, that has at least 10% of its total volume submerged below the ground. Typical UST systems include the tank, all connected piping, underground equipment, and any containment system.

UST's are, and have always been, a major environmental concern due to the intensity of the potential effects that could occur if there is a leak. As of September 30, 2001,



418,918 releases have been reported from UST's (Office of Underground Storage Tanks, EPA). There are 8,853 UST's alone in Kansas and 4,357 (nearly half) have confirmed releases. The causes of the releases were leaks, spills, and overfills. Fumes and vapors



can travel into the ground and collect in basements or parking garages that could lead to explosion, fire, or asphyxiation.

Gasoline and MTBE, a fuel additive, are some of the major contributors to

contamination in groundwater primarily due to UST's (coupled with urban runoff).

~ Industrial Facilities ~

Industrial facilities treat their waste streams in a variety of ways. Some facilities dispose of waste into the sewer, some pre-treat the waste before disposal, and some industries provide full treatment.

Industrial lagoons are one method to treat wastewater from industrial facilities. Earthen liners are a popular medium between the wastewater and the ground. A breach in the liner could result in groundwater contamination. Bureau of Water in the Kansas Department of Health and Environment recommends new



lagoons that are being constructed use synthetic liner systems to protect the groundwater. This is a “policy” and is not enforceable at this time.

Industrial landfills do not receive hazardous wastes but they do receive waste from facilities such as foundries, coal-fired power plants, and cement kilns. Infiltration through older landfills is inevitable. The lack of a leachate collection system or a liner could allow groundwater contamination. However, new industrial landfills are being



constructed with liner systems in order to effectively prevent future contamination. Construction and demolition landfills encounter the same situations only with different wastes such as wood, paperboard products (largest fraction of waste in U.S.) and several different chemicals.

~ Feed Lots & Agriculture ~

Confined Animal Feeding Operations (CAFOs) are locations where animals are kept and raised in a relatively confined area. Modern swine CAFOs most often use a specially designed confinement building.

Cattle CAFOs generally use an open lot and collect the runoff from the open lot. Dairy CAFOs use an open lot or a combination of an open area and a partially covered confinement building.



Other CAFOs, such as

kennels, emu and ostrich farms, etc. use a variety of waste collection systems. Runoff from the open lot or waste from the confinement building is collected and land applied as a nutrient for crops or pasture.

CAFO requirements vary with the number of animals confined. The primary goal of the requirements is to prevent discharges of animal waste to rivers, streams, or lakes. CAFOs are required to have a permit for discharges during extreme wet conditions from the Bureau of Water within KDHE. They are regulated under the provisions of K.S.A. 65-101 *et seq.*

Chemigation is a process where chemicals or livestock wastes are collected and added to the irrigation water. This could be hazardous if the chemigation process does

not thoroughly mix the proper amounts of each. Pesticide and fertilizer storage are used as a holding ground until they are needed. Contamination can occur due to poor mixing, spills, or leaks in the storage.



~ **Wastewater Treatment Plants** ~



Wastewater treatment plants (WWTP), both industrial and municipal, treat the wastewater with chemical and biological processes. Their purpose is to eliminate contaminants before the effluent is released back into the local waterway. Municipal WWTP are generally run by the city and serve its inhabitants. Industrial WWTP only open their business to specific facilities or several depending on whether or not the same type of wastewater is being delivered there. Both WWTP are required to have a permit from the Bureau of Water within the Kansas Department of Health and Environment (KDHE). Any discharges into the environment require an NPDES permit as well. There is little potential for groundwater contamination because construction and operation requirements are so stringent and the threat of hefty fines is always present.



~ **Urban Sources** ~

Urban runoff is constant of concern for environmentalist because of the non-point pollution that is generally associated with it. When precipitation, in any shape or form, occurs in urban areas it eventually find its way to the nearest storm water sewer system. While flowing towards a waterway, runoff will gather residue that was previously there such as fertilizer, gasoline, oil, pesticides, de-icing salt, and sediments. All of this runoff

and non-point pollution will gather in the sewer systems where it will be lead straight back into the waterway.



BEST MANAGEMENT PRACTICES

~ Agricultural & Rural BMPs ~

Best Management Practices (BMPs) are essential tools in every area of today's local, regional, national, and global business. BMPs are utilized in order to generate maximum efficiency of time, money, and final products and all the while acknowledging environmental concerns. In regards to agricultural and rural BMPs, maximum efficiency translates as minimizing water quality impacts. It is essential with any agricultural and rural BMP to discuss non-point BMPs as well because they share a symbiotic relationship. Four common BMPs for agricultural and rural entities are as follows:

1. Conservation Tillage.
2. Crop Nutrient Management.
3. Pest Management.
4. Conservation Buffers.

Conservation tillage consists of leaving crop byproducts in the vicinity where they lie. This might include decaying leaves, roots, and stems. By doing so, these byproducts of agriculture will create a natural barrier against runoff and soil erosion. Not only is it a suitable defense mechanism but a logical method of retaining desired fertilizer, nutrients, pesticides, and soil moisture.

Crop nutrient management is used to monitor all nutrient inputs. Tracking the amount and quantity of nutrients will create good bookkeeping and reduce excess loadings. It can also help prevent unwanted buildups in soil and protect air quality.

Pest management is beneficial in the overall health of the environment by economically eliminating the desired target or targets and abiding by the legal aspects of point source discharges.

Conservation buffers might include grassed waterways to riparian areas to effectively reduce potential pollutants that would otherwise be introduced into surface waters. This is the easiest means of managing erosion and controlling pollution. Farming directly up to and through intermittent waterways is common. Maintenance of buffer strips on both sides of a waterway a minimum of 50' wide, as well as vegetation in an intermittent waterway, are proven defense to non-point source pollution.

The natural extension of agricultural BMPs is non-point management measures. These BMPs are just as important as the previous ones. Minimizing water quality impacts is again the goal for achieving maximum efficiency and the desired results. Non-point BMPs include the following:

1. Irrigation Water Management
2. Grazing Management
3. Animal Feeding Operations Management (AFOs)
4. Erosion and Sediment Control.

~ Urban BMPs ~

Urban BMPs take on somewhat of a different angle of attack. When discussing agricultural and rural BMPs there exists an idea of preventing unwanted situations completely. But when discussing urban BMPs it is understood that pollution, to some extent, has occurred. Urban BMPs will discuss the best way to deal with the current status of the system.

Plans for new development should attempt to maintain predetermined volumes of runoff that have been deemed appropriate. Areas with new development should also attempt to implement the best layout, which includes structural controls that channel runoff to desired endpoints. Other common goals include minimizing land disturbances, retaining natural drainage and vegetation, and protecting sensitive ecological areas.

Plans for controlling existing developments is much more expensive than new developments because it requires more work to manage areas that were constructed without any thought of pollution prevention. Therefore, the appropriate angle of attack is to identify priority pollutant reduction opportunities. Once this has been established, other BMPs for existing developments can be implemented such as protecting current controlled runoff and begin restoration and recovery programs. The Brownsfield initiative is a perfect example of this process because run down, contaminated, industrial facilities are cleaned up and transformed into recreational areas for the benefit of the local public and the environment.

Plans for on-site disposal systems should help control nutrient and pathogen loadings to surface water. Septic systems must be inspected on a regular basis and be

located away from all surface waters in order to reduce the risk of potential leaks or spills.

Education is crucial in pollution prevention. Outreach programs and/or school programs can educate both the young and old on current issues and pollution prevention in hopes that it will spawn a new generation of environmentally conscience public.

Well T34S, R33W, Sec. 6, SWSWSW, Action: Constructed

Location Info		
	County:	Location: T34S, R33W, Sec. 6,
	Owner:	Status: Constructed

General Info		
	Well Depth: 340 ft.	Elevation: ft.
	Static Water Level: 170 ft.	Well Use: Oil Field Water Supply
	Est. Yield: 95 gpm.	

Casing Info		
		Casing Type: PVC
	Diam: 5 in. to 340 ft.	
	Diam: 0 in. to 0 ft.	
	Diam: 0 in. to 0 ft.	

Grout Info		
	Grout used: NEAT CEMENT and OTHER	
	From: 1 to 15 ft.	
	From: 15 to 100 ft.	
	From: 0 to 0 ft.	

Contamination Info		
	Contamination type: OIL WELL/GAS WELL	
	Direction:	Distance: 0

Screen and Perforation Info		
	Screen Type: TORCH CUT	Screen Openings: SAW CUT
	From: 260 ft. to 340 ft.	From: 0 ft. to 0 ft.
	From: 0 ft. to 0 ft.	From: 0 ft. to 0 ft.

Lithologic Log		
	From: 0 ft. to 190 ft.	Type: SANDY CLAY
	From: 190 ft. to 252 ft.	Type: SAND
	From: 252 ft. to 260 ft.	Type: SANDY CLAY
	From: 260 ft. to 326 ft.	Type: SAND
	From: 326 ft. to 340 ft.	Type: SANDY CLAY

PRESS RELEASE

(Public Water Supply (PWS)) releases final Source Water Assessment for public comment.

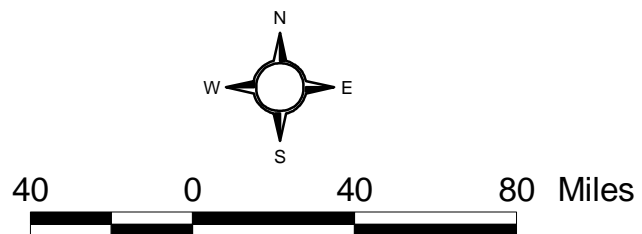
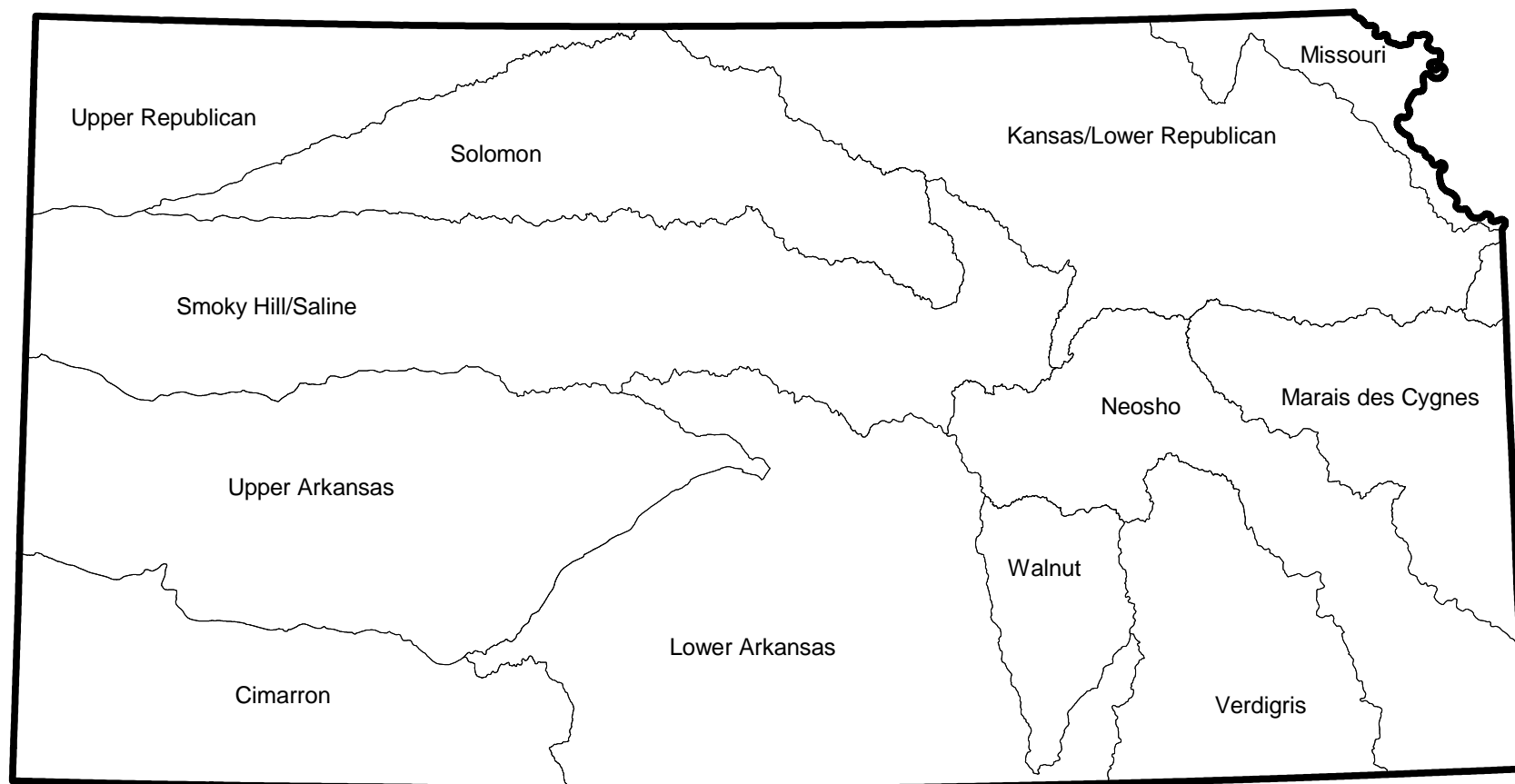
An adequate supply of quality drinking water is a valuable resource for a community. Unfortunately, drinking water supplies are often susceptible to contamination. In accordance with the 1996 amendments to the Safe Drinking Water Act, the Kansas Department of Health and Environment has implemented the Kansas Source Water Assessment Program (SWAP). The Kansas SWAP requires KDHE to complete Source Water Assessments for every public water supply that treats and distributes raw source water. Source Water Assessments identify potential sources of contamination and determine the susceptibility to contamination from a given pollutant.

The (PWS) has partnered with KDHE to complete our local Source Water Assessment Report. A copy of this report is available for review at (list location). If there is sufficient local interest, a public meeting will be held to discuss potential pollution sources, water quality protection measures, and source water protection planning.

The final Source Water Assessment Report will serve as the cornerstone for future wellhead and watershed protection activities in our community.

APPENDIX E

12 MAJOR WATER BODIES



Appendix E
Kansas Major River Basins

APPENDIX F

TYPICAL SWA REPORT

Source Water Assessment Report



Public Water Supply: YODER MEATS

**Assessment Areas Include:
1071**



Kansas Department of Health and Environment
Bureau of Water Watershed Management Section
1000 SW Jackson St., Suite 420
Topeka, KS 66612-1367



Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114



Kansas Geological Survey University of Kansas
1930 Constant Ave.
Lawrence, KS 66047

Reports were generated with the Automated Source Water Assessment Tool (ASWAT). Assessments were completed online using ASWAT by hundreds of state employees, public water supply staff, and technical assistant providers throughout the State of Kansas.

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Report Description

Detailed Explanation of Entire Report:

The 1996 amendments to the Safe Drinking Water Act require each state to develop a Source Water Assessment Program (SWAP) and a Source Water Assessment (SWA) for each Public Water Supply (PWS) that treats and distributes raw source water. In Kansas there are 761 public water supplies that require SWAs. A SWA includes a delineation of the source water assessment area, an inventory of potential contaminant sources, and a susceptibility analysis.

A PWS can consist of one or more individual assessment areas that require different assessments. In general, an assessment area is delineated at a two-mile fixed radius for a groundwater well. A surface water intake assessment area is the upstream-drainage area (watershed), inside the state border. Additionally, an assessment area can consist of an individual well, group of wells, an individual surface water intake, or multiple surface water intakes.

After each assessment is completed a report is automatically generated using an Internet-based application called the Automated Source Water Assessment Tool (ASWAT). The individual assessment reports combine to form the entire SWA report for a PWS.

A map of each Assessment Area was also generated with ASWAT. However, for security reasons the maps are not included in this report. To obtain a copy of the map(s), please contact your local PWS.

All PWS reports will be available for viewing and downloading on KDHE's Watershed Management Section website(<http://www.kdhe.state.ks.us/nps>) in 2004.

YODER MEATS Summary:

AA	Type	Diversion Id
1071	Ground water single well	01

Public Water Supply: **YODER MEATS**
Assessment Area: **1071**
Diversion Id's: **01**
Status: **Accepted**
Submit Date: **2003-05-08 14:59:35**

Executive Summary:

The Executive Summary gives the assessment area's Susceptibility Likelihood Score (SLS) for each contaminant of concern category.

SLS indicates which contaminant category is most likely to impact a given public water supply. Contaminants of concern for groundwater include microbiological, inorganic compounds, nitrates, synthetic organic compounds, pesticides, and volatile organic compounds. Contaminants of concern for surface water include microbiological, inorganic compounds, eutrophication – phosphorus, sedimentation, synthetic organic compounds, pesticides, and volatile organic compounds.

To determine the assessment area's susceptibility to contamination, a qualitative (semi-quantitative) screening level susceptibility analysis was designed that utilizes general assumptions and best professional judgement. It is a systematic procedure comprised of simple yes/no questions. Each question in the susceptibility analysis focuses on the presence or absence of potential pollution sources in the assessment area. SLS is most useful in helping the Public Water Supply (PWS) focus on water quality protection actions towards a contaminant category of concern. For example, if the SLS for microbiological contamination is high, relative to volatile organic compounds (VOC), water supply protection planners would conclude that the attention should be directed towards microbiological contaminant sources rather than VOC sources.

Executive Summary

Public Water Supply: **YODER MEATS**

Assessment Area: **1071**

Susceptibility Likelihood Scores for Assessment Area

Contaminant Category	A	B	B*	C	C*	D
Susceptibility Likelihood Score – SLS	66	63	66	56	62	55
SLS Range	Mid	Mid	Mid	Mid	Mid	Mid

A – Microbiological

B* – Nitrates

C* – Pesticides

B – Inorganic Compounds

C – Synthetic Organic Compounds

D – Volatile Organic Compounds

Susceptibility Likelihood Range

SLS Range	
0–50	Low Susceptibility
51–80	Moderate Susceptibility
81–100	High Susceptibility

Public Water Supply: **YODER MEATS**
Assessment Area: **1071**
Diversion Id's: **01**
Status: **Accepted**
Submit Date: **2003-05-08 14:59:35**

Potential Sources:

The Potential Sources section lists all the sites that have been identified as potential sources of contamination.

Potential sources of contamination may include land uses, industry, or businesses that could generate or store chemicals/substances that could potentially contaminate the water supply only if released into the environment. Both unregulated sites from business location databases and regulated sites from various KDHE databases were compiled. Additional sites could have been added by an evaluator through the assessment process to supplement the original data.

The 1987 Standard Industrial Classifications (SIC) were used to identify potential contaminate sites. The SIC system classifies establishments into industries on the basis of the primary activities of the establishment.

Each assessment area is delineated with 3 assessment zones. These zones can be used to get a general understanding of the potential influence sites have based on proximity to the water supply. Zone A is a 100-foot radius around a groundwater well and a 1000-foot radius around a surface water intake. Zone B is a 2000-foot radius around wells and a hydrological delineated buffer around the surface water sources. Zone C is a 2-mile radius around wells and the balance of the watershed for intakes. The potential sources listed in this section are sorted to show all the potential sources in Zone A first, Zone B second, and Zone C third.

Although a facility or business is identified in the study as a potential concern, it does not necessarily mean a release or spill has occurred. Contamination could only occur if certain chemical substances are released into the environment and filter into the water supply source.

The data for the potential sources of contamination was compiled from May through August in 2002. Some of the databases used were incomplete datasets that are continually being updated. Due to the incompleteness, inaccuracies, and new development, it is possible that sources of potential contamination that are in the assessment area are not included in the report. Inaccurate locations could also cause sources to show up in the assessment area that are not actually in the assessment. Additionally, duplication between the datasets could cause sites to show up multiple times in the assessment area.

Potential Sources

Public Water Supply: **YODER MEATS**

Assessment Area: **1071**

Unregulated Potential Site Sources

Source No.	SIC Description	SIC ID	Zone
201437	Public Building and Related Furniture Manufacturing	2531	C
201449	Fabricated Metal Products Manufacturing	3499	C
201470	Motor Vehicles and Car Bodies Manufacturing	3711	C

Regulated Confined Animal Feeding Operations Potential Site Sources

Source No.	Source Name	ID/Permit No.	Zone
2000195	Borntrager, Eli A.	A-ARRN-M044	A
2000343	Bontrager, Harry W.	A-ARRN-M038	A
2000281	Schrock, Eli And Wilma	A-ARRN-M036	C

Regulated Hazardous Waste Potential Site Sources

Did Not Contain Any Of These Potential Site Sources

Regulated Leaking Storage Tank Potential Site Sources

Did Not Contain Any Of These Potential Site Sources

Regulated Identified Contaminated Potential Site Sources

Source No.	Source Name	ID/Permit No.	Zone
7000194	DELUXE SPECIALTIES MFG. CO.	C207870824	C

Regulated Solid Waste Potential Site Sources

Did Not Contain Any Of These Potential Site Sources

Regulated Waste Water Potential Site Sources

Source No.	Source Name	ID/Permit No.	Zone
6000227	RENO CO. S.D. #202	M-AR49-OO06	C
6000614	RENO CO. S.D. #202	I-AR98-PO01	C
6001062	RENO COUNTY S.D. NO. 201	M-AR49-NO07	C
6002001	DELUXE TANK MFG. CO.	P-AR98-OO01	C

Public Water Supply: **YODER MEATS**
Assessment Area: **1071**
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Added Sources:

The Added Sources section lists all the sites that have been added as potential sources of contamination by an evaluator through the assessment process to supplement the original data.

The potential sources listed in this section are sorted to show the added potential sources in Zone A first, Zone B second, and Zone C third.

Although a facility or business was added as a potential concern, it does not necessarily mean a release or spill has occurred. Contamination could only occur if certain chemical substances are released into the environment and filter into the water supply source.

Added Sources

Public Water Supply: **YODER MEATS**

Assessment Area: **1071**

Added Potential Site Sources

Source No.	Source Name	SIC ID	Zone
Did Not Add Any Site Sources			

Public Water Supply: **YODER MEATS**
Assessment Area: **1071**
Diversion Id's: **01**
Status: **Accepted**
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Potential Contaminants Summary:

The Contaminants Summary shows the number of identified unregulated sources in the assessment area for each contaminant of concern category.

In order to obtain the number of sources for each category, a relationship was correlated between each Standard Industrial Classification (SIC) and the contaminant of concern categories. Each SIC was assessed and associated with contaminant categories. For example, if not managed properly, a car wash (SIC 7542) could potentially contaminate an intake because of inorganic compounds (IOC) and volatile organic compounds (VOC); thus, a car wash is associated with IOCs and VOCs.

A chart displays a count for each contaminant category. The sum for each category represents the total number of identified sources that have been associated with that particular contaminant category. However, the total number of identified sources does not include contaminants from the Added Sources. In our example, a car wash would be considered 2 sources of contamination. It would be a potential source of contamination for IOCs and for VOCs; thus, 1 would be added to the total number of sources in the VOC category and 1 would be added to the IOC category.

Potential Contaminants Summary

Public Water Supply: **YODER MEATS**

Assessment Area: **1071**

Number of Unregulated Site Sources Identified for each Contaminant Category

MicroBiological	Pesticides	IOC's	SOC's	VOC's	Nitrates
0	0	3	0	3	0

A – Microbiological

B* – Nitrates

C* – Pesticides

B – Inorganic Compounds

C – Synthetic Organic Compounds

D – Volatile Organic Compounds

Public Water Supply: **YODER MEATS**
Assessment Area: **1071**
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Status: **Accepted**
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Potential Contaminants Listing:

The Potential Contaminants section lists the contaminant of concern category associated with each Standard Industrial Classification (SIC) found in an assessment area. A complete list of contaminant category codes are located at the bottom of this page.

The relationships defined between the Standard Industrial Classifications (SIC) and the contaminant of concern categories are displayed in a table format. Using our car wash example, the relationships can be better illustrated. A car wash could release IOC and VOC chemical substances. The connection is shown by indicating the SIC, 7542, and the associated contaminant categories, IOC (Category B) and VOC (Category D). However, the contaminants listed are not associated with any Added Sources.

The list is sorted by the SIC source description and it only shows unique SIC sources. For example, an assessment area can have 20 car washes in an assessment area, but the list is only going to show contaminant categories associated with car washes onetime. This is because all car washes have the same SIC and every car wash poses the same potential threat to water intakes.

A – Microbiological	B – Inorganic Compounds	B1 – Eutrophication – Phosphorous
B2 – Sedimentation	B* – Nitrates	C – Synthetic Organic Compounds
C* – Pesticides	D – Volatile Organic Compounds	

Potential Contaminants Listing

Public Water Supply: **YODER MEATS**

Assessment Area: **1071**

Unregulated Identified Site Sources and associated Potential Contaminant Category

SIC ID	SIC Source	Potential Contaminant	Contaminant Category
3499	Fabricated Metal Products Manufacturing	inorganics, VOCs	B
"	"	"	D
3711	Motor Vehicles and Car Bodies Manufacturing	inorganics, VOCs	B
"	"	"	D
2531	Public Building and Related Furniture Manufacturing	TSS, VOCs	B
"	"	"	D

Public Water Supply: **YODER MEATS**
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Protection Measures:

The Protection Measures section shows water quality protection measures for the Standard Industrial Classifications (SIC) identified in the assessment area.

Previous sections of this report are designed to show areas that Public Water Supplies (PWS) can focus on to improve the susceptibility of an assessment area. This section helps identify water quality protection measures that a PWS can use as guidance for implementing action for a potential contaminant site in the assessment area. It focuses on protection measures that can reduce the risk of contamination to the water supply.

This portion of the report only displays water quality protection measures for each type of SIC found in the assessment area. It does not display protection measures for each site in the assessment area because every SIC should have the same or similar water quality protection management practices. However, the protection measures listed are not associated with any Added Sources.

Protection Measures

Public Water Supply: **YODER MEATS**

Assessment Area: **1071**

Recommended Water Quality Protection Measures

SIC	SIC Source	Contaminant Source	Water Quality Protection Measure	Regulatory Authority
3499	Fabricated Metal Products Manufacturing	inorganics, VOCs	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
3711	Motor Vehicles and Car Bodies Manufacturing	inorganics, VOCs	Manage wastes properly and treat process wastewater prior to discharge to a POTW or direct	State or federal Storm water pollution prevention regulations
2531	Public Building and Related Furniture Manufacturing	TSS, VOCs	Discharge of process waters to POTW.	State or federal Storm water pollution prevention regulations

Public Water Supply: **YODER MEATS**
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Assessment Analysis:

The Assessment Analysis section displays the numbers assigned to each contaminant of concern category for each question in the susceptibility analysis.

This analysis is based on a decision tree framework consisting of a series of yes/no questions. These questions consider the proximity of contaminant sources to the water supply intake, the type of contaminant, and the application of pollution prevention or water quality protection practices to sources of contamination. As the evaluator moves through the analytical framework, susceptibility points are accumulated based on the presence of contaminant sources in the assessment area.

After all the questions have been answered, the SLS is calculated for each contaminant of concern category. The SLS is determined by counting the number of contamination risk factors found to occur in the delineated assessment area and applying a multiplier to this number. Because the number of contaminant category risk factors is not equal, the multiplier is used to establish a common scale for the SLS of each contaminant category.

Assessment Analysis

Public Water Supply: **YODER MEATS**

Assessment Area: **1071**

Ground Water Single Well Analysis

A – Microbiological **B** – Inorganic Compounds

B* – Nitrates **C** – Synthetic Organic Compounds

C* – Pesticides **D** – Volatile Organic Compounds

No.	Question	Response	A	B	B*	C	C*	D
1	Is the well under the influence of surface water?	No	0	0	0	0	0	0
2	Does the well meet KS water well construction standards?	Yes	0	0	0	0	0	0
3	Is the depth of the well less than 30 feet?	No	0	0	0	0	0	0
4	Are there unplugged, abandoned water wells present in Zone A?	No	0	0	0	0	0	0
5	Is there gravel pack within 20 feet of the surface?	No	0	0	0	0	0	0
6	Does a PWS own or control Zone A?	Yes	0	0	0	0	0	0
7	Does Zone A consist entirely of native grass?	No	1	1	1	1	1	1
8	Is there a contaminated well in the Zone A?	No	0	0	0	0	0	0
9	Is a class V UIC well present?	Yes	1	1	1	1	1	1
10	Are any commercial, industrial, or urban areas present in Zone B?	Yes	1	1	1	1	1	1
11	Does each industrial/commercial site and urban area have a water quality protection plan in place?	No	1	1	1	1	1	1
12	Are any non-farm home sites present in Zone B?	Yes	1	0	1	0	1	0
13	Do all the non-farm home sites have a water quality protection plan?	No	1	0	1	0	1	0
14	Are any farmsteads present in Zone B?	Yes	1	1	1	1	1	1
15	Do all farmsteads have a water quality protection plan?	No	1	1	1	1	1	1
16	Does Zone B consist entirely of native grass?	No	1	1	1	1	1	1
17	Is there grazing livestock in Zone B?	Yes	1	0	1	0	0	0

No.	Question	Response	A	B	B*	C	C*	D
18	Do all the livestock producers have water quality protection measures in place?	No	1	0	1	0	0	0
19	Is there livestock confinement in Zone B?	Yes	1	1	1	0	1	0
20	Is each confined animal feeding operation registered with KDHE?	No	1	1	1	0	1	0
21	Is there corn or grain sorghum production in Zone B?	Yes	0	0	1	0	1	0
22	Are corn/grain sorghum nutrient and pesticide management plans in use for each site?	No	0	0	1	0	1	0
23	Are any orchards present in Zone B?	No	0	0	0	0	0	0
24	Are orchard nutrient and pesticide plans in use for each site?	Yes	0	0	0	0	0	0
25	Are there unsewered developments (concentrations of lagoons or septic systems) present in Zone B?	Yes	1	1	1	0	0	0
26	Is there a railroad or major highway in Zone B or C?	Yes	0	1	1	1	1	1
27	Is there oil production in Zone B or C?	Yes	0	1	0	1	0	1
28	Do coarse textured soils predominate Zones A, B and C?	No	0	0	0	0	0	0
29	Is an irrigation well located in Zone B or C?	Yes	0	1	1	1	1	1
30	Is a wastewater treatment facility in Zone B or C?	Yes	1	1	1	1	1	1
31	Is a solid waste landfill in Zone B or C?	No	0	0	0	0	0	0
32	Are there unplugged, abandoned water wells present in Zone B or C?	Yes	1	0	0	0	0	0
33	Are any commercial, industrial, or urban areas present in Zone C?	Yes	1	1	1	1	1	1
34	Are water quality protection plans in use for each site/area?	No	1	1	1	1	1	1
35	Is there livestock confinement in Zone C?	Yes	1	1	1	1	1	0
36	Is each confined livestock facility registered with KDHE?	No	1	1	1	0	1	0
37	Do all the livestock producers have water quality protection measures in place?	No	1	0	1	0	0	0
38	Are cropland nutrient management plans in place?	No	0	0	1	0	0	0
39	Are cropland pesticide management plans in place?	No	0	0	0	0	1	0
40	Does a perennial stream flow into Zone C?	No	0	0	0	0	0	0
41	Are watershed water quality protection plans in place?	Yes	0	0	0	0	0	0

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Site Comments:

The Site Comments section lists all the comments that were added for the potential sources of contamination found in the assessment area.

Local comments and feedback from people that are familiar with the assessment area is an important aspect of the assessment. The comments greatly improve the assessment by adding detail to the sites that can be referenced for more information.

This local information may include comments on potential contamination threats (or lack there of), local water quality protection initiatives, etc. Adding comments are optional and are mainly focused on sources in areas that could have the greatest impact on water supply if a spill or release occurred in the environment. It is left to the discretion of the PWS and/or source water assessment committee to add comments.

Site Comments

Public Water Supply: **YODER MEATS**
Assessment Area: **1071**

Comments for Unregulated Sites

Did Not Receive Any Comments

Comments for Regulated Confined Animal Feeding Operations Sites

Did Not Receive Any Comments

Comments for Regulated Hazardous Waste Sites

Did Not Receive Any Comments

Comments for Regulated Leaking Storage Tank Sites

Did Not Receive Any Comments

Comments for Regulated Identified Contaminated Sites

Did Not Receive Any Comments

Comments for Regulated Solid Waste Sites

Did Not Receive Any Comments

Comments for Regulated Waste Water Sites

Did Not Receive Any Comments

Public Water Supply: **YODER MEATS**
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Added Site Comments:

The Added Site Comments section lists the comments for why sites were added as a potential source of contamination found to the assessment area.

Added Site Comments

Public Water Supply: **YODER MEATS**

Assessment Area: **1071**

Comments for Added Contaminant Sites

Added Contaminant Site Name	Site No.	Site Comments	Author
Did Not Receive Any Comments			

Public Water Supply: **YODER MEATS**
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Analysis Question Comments:

The Analysis Question Comments section lists all the comments that were added during analysis portion of the assessment, in which a series of yes/no questions were asked.

Evaluators have the option to add comments to questions to clarify why a response was given or to give more details to a question. Local comments and feedback from people that are familiar with the assessment area is an important aspect of the assessment. The comments greatly improve the assessment by adding clarification and details that could not be identified with a simple yes or no response.

Analysis Question Comments

Public Water Supply: **YODER MEATS**

Assessment Area: **1071**

Comments for Analysis Questions

Analysis Question	Question Comments	Author
Is there gravel pack within 20 feet of the surface?	No well log available	Peggy Holloway
Is each confined animal feeding operation registered with KDHE?	Not enough animals to be registered with KDHE	Peggy Holloway
Do coarse textured soils predominate Zones A, B and C?	Vanosis series– surface is brown silt loam, Subsoil is brown, friable clay loam	Peggy Holloway
Is each confined livestock facility registered with KDHE?	Some sites have too few animals to register with KDEH	Peggy Holloway
Are there unplugged, abandoned water wells present in Zone B or C?	unknown	Peggy Holloway
Does each industrial/commercial site and urban area have a water quality protection plan in place?	unknown	Peggy Holloway

APPENDIX G

CD – SWA REPORTS, MAPS, &

ASSESSMENT AREAS

